MEDICAL REPOSITORY,

FOR

NOVEMBER AND DECEMBER, 1805, AND JANUARY, 1806.

A LETTER *on* CALORIC; *addressed to Dr.* MITCHILL, *by* THOMAS EWELL, *M. D. of Virginia.*

SINCE I had the honour of being with you, I have made two experiments which completely establish the doctrine of the materiality of heat denied by Count Rumford and other respectable philosophers. Your love of truth has induced me to hasten to communicate them to you, and I hope the result will give you satisfaction.

It is highly probable that the doctrine of the materiality of heat is considered generally as correct, notwithstanding the specious arguments urged in opposition to the theory. There is, however, no positive proof on which the opinion is rested. The chemists have displayed great ingenuity in explaining the various phenomena produced by heat. With great readiness they have accounted for facts which are apparently contradictory. They have assigned good reasons why heat diminishes the bulk of some bodies, as argillaceous earth, while it enlarges most others; why cold, or an abstraction of heat, lessens the size of most substances, while it increases the bulk of water about to conglaciate; and they have given good reasons why all the experiments they have instituted to ascertain the gravity of heat have failed. The celebrated *Muschenbroeck* has also evinced great ingenuity in support of his doctrine of frigorific particles. As it would be useless to undertake to refute all the arguments advanced in support of the hypothesis, I shall proceed to relate my experiments.

I procured a pair of excellent scales, of so nice a construction that their balance could be destroyed by one-fourth of a grain. Two ounce vials nearly half filled, one with concentrated sulphuric acid, and the other with common water, were tightly stopped and exactly weighed. After I ascer-

tained very precisely the weight, I poured the water of the one vial into the acid of the other, and, to prevent evaporation, immediately replaced the stoppers. The heat, as is usual on making such mixtures, was very considerable. As soon as all of it had escaped, so that the equilibrium in the temperature was restored, I weighed the vials with great caution a second time. On doing this I found that the loss of weight was equal to one grain and a half; which loss could have proceeded only from the conversion of latent into sensible heat, and its consequent escape.

After performing the above experiment, I proceeded to the second in the following manner: As recommended in the Philosophical Transactions for 1787, by Dr. Beddoes, on behalf of Mr. Walker, I procured eleven parts of the muriate of ammoniac, ten of the nitrate of pot-ash, sixteen of the sulphate of soda, and thirty-two of water. The weight of the whole, with the vial containing the water, was precisely two ounces. I suddenly added the salts to the water, and directly corked the vial to prevent the condensation of the water in the surrounding air. The cold which followed was considerable, and continued so for several minutes. When the mixture ceased to absorb the sensible heat of the air, with the greatest care I wiped off all the water that had been condensed on the exterior of the vial before a warm fire. The vial with its contents was then weighed, and I found that the weight was increased half a grain, which addition could only have proceeded from the absorption of sensible heat through the vial.

Of the correctness of these experiments any one may satisfy himself if he proceed with proper caution. Should there be any variation in the results, I believe it will be inconsiderable. The first experiment appears more conclusive than the second; and, in justice to one of my former fellow students, I ought to observe, that during a conversation I had with him, on my proposing the second experiment to ascertain the materiality of heat, he suggested the first. From a constant exchange of sentiment which I enjoyed while in Philadelphia among the students, the gentleman has escaped my recollection.

That various substances have their capacities for heat altered, that some unite with heat, while others give it up, as originally suggested by the great Dr. Black, there can now be no doubt. The heat must chemically combine with such bodies, and in proportion to the quantity there must be a

change of properties. The properties depending on the latent heat appear to me more important than seem generally believed. They appear of such consequence, that I think some of the processes in animals depend in a great measure upon this combined caloric. The process of respiration has long occupied the attention of many philosophic observers. Perhaps their not succeeding in the investigation depended on their supposing the mystery of the operation was proportionate to its importance. The theory of Lavoisier, the immortal father of French chemistry, has long since been refuted. It is scarcely possible that hydrogen and carbon could unite in the lungs to oxygen, without occasioning a destruction of the parts by the sensible heat that would be eliminated. The fixed air and halitus said to have been formed during the combustion of carbon and hydrogen must be simply an exhalation from the lungs, or an excretion. The theory that followed the above appears no better. According to this we must suppose that phosphorus exists formed in the blood, that oxygen unites with this phosphorus, although it be combined with the blood, and that the phosphoric acid then unites with the iron, to form the colouring matter. Equally destitute of foundation appears the hypothesis, that oxygen unites with the blood. In the first place, what proof have we that the chemical combination of the air can be destroyed by the blood? and in the second place, if the base of oxygen gas were to unite in the lungs, would not the sensible heat of the blood in other parts of the body convert it again into the gaseous state, and cause death, just as oxygen gas does when injected in the blood vessels? But these theories do not explain many facts which are presented to our consideration when examining the phenomena of respiration. Among these I will mention great coldness of the body, notwithstanding a free circulation of blood; and at other times excessive heat, while the circulation is scarcely discernible. I have no hesitation, after reflecting on this subject, in saying, that the true theory of respiration remains to be revealed; and I should be highly gratified if the following opinions should be found to approach nearer to truth.

That the air contains a considerable quantity of latent as well as sensible heat, is unquestionably shown by so many facts, that I need not relate any in this place. That the air may have its capacities for heat altered, like most other fluids, when the circumstances in which it is placed are

varied, there can be no doubt. That the circumstances of the air when pressed down into the delicately organized air-cells of the lungs are materially changed, is equally certain. That the blood is changed by change of circumstances, and that the organization of the blood vessels in the lungs differs from that of most other parts of the body, no one will deny. Now, from this view of facts it appears to me that the air loses its capacity for latent caloric in the lungs, that the blood at the same time acquires an additional capacity for this caloric in the adjacent vessels, and consequently the caloric of the air immediately unites with the blood, and gives it the new properties of redness, capacity to stimulate the animal fibre, &c. &c. This theory will enable us to account for many facts which come daily under our observation.

As the capacities of fluids to take in or give up heat depend on the mechanism or state of parts in which they are, and as the organization of parts is known to vary considerably, we are led to expect the irregular appearances of heat on the surface of the animal body. Accordingly we find that in general only a certain quantity of heat is given up by the blood when it arrives near the skin; but when the state of parts is altered, there is a great difference in the quantity. When the coldness is considerable, the blood acquires the power on the surface of the body to convert the sensible heat of the air into latent heat, and to combine with it just as it does in the lungs. This combination on the skin we believe to be precisely the same as that in the lungs. Hence redness, &c. is often acquired by the blood on parts that are inflamed. Dr. Klapp's experiments to disprove the absorption of oxygen from the skin do not militate against our doctrine. It is upon these principles that I would account for the escape of heat from the body after death for several hours. The altered state of the vessels would naturally produce a change in the capacities in the fluids; and as this change would be but slow after death, so would the escape of heat continue for some time.

Our theory is corroborated by the fact that nitre and the acids have the power of increasing the irritability of the animal fibre. Fontana has proved that the blood, when of a proper quality, gives this irritability to fibres. This quality of the blood is acquired from the air, and as we believe from the latent caloric of the air. As the body of caloric exists in considerable quantities in acids, and as this caloric

gives the irritability to fibres through the medium of the blood, we are led to conclude that the additional quantity of the caloric existing in the acid would impart to the blood an additional power to give irritability.

With your permission I would make the following queries. May not chemists be mistaken in their idea that there is such a body as "the base of oxygen gas?" May not all the changes said to be produced by oxygen depend on the caloric which is combined in different degrees with substances? For example, may not the differences between atmospheric air, oxygen gas, and nitric acid, depend on the various quantities of caloric in a given bulk?

But these are only suggestions which I hope you will receive as an earnest of my desire to discover truth. Hereafter I hope to prosecute the subject with more success.

Some ACCOUNT *of the* DISEASES *which prevailed at* WAYNESBOROUGH *(Georgia), and a few Observations on* YELLOW FEVER, *and the principal Remedies of* FEVER: *Communicated by Dr.* JOSHUA E. WHITE, *of Savannah, (Georgia).*

[Continued from p. 154, and concluded.]

THIRD. *Clysters.* As promoting evacuations by the intestinal canal, they should be seldom dispensed with; as sometimes superseding the necessity of purgatives by the mouth, and as always aiding their operation, they become of much importance in the cure of fevers. Irritability of the stomach often forbids the use of cathartics by the mouth. Clysters here afford a happy succedaneum. This part of the French mode of practice is founded upon the most just principles. Like purges, however, we cannot calculate with certainty on the effects to be produced, nor can we always control their operation.

Fourth. *Blisters.* They are seldom necessary in the early stage of febrile diseases, except where their force is exerted upon a part essential to life. Here it sometimes becomes necessary to apply them before the general excitement is lowered, and they often avert danger by making a derivation;* but we are not to rely on their use alone for prevent-

* Dr. Rush has remarked, that "blisters are useful in depleting from those parts which are the seats of topical inflammation. The relief obtained by them in this way more than balances their stimulus upon the whole system. I need hardly say, that their effects in reducing the morbid and excessive action of the blood vessels are very feeble."

ing a return of the particular morbid action. Regarding this as only a symptom, we must strike at the root of disease by bleeding and purging. They frequently give time for the use of these remedies, particularly the latter. Applied to the wrists or inside of the thighs, they check vomiting; and Dr. Miller says, "blisters are entitled to great confidence, especially when applied to the epigastric region for the purpose of relieving the local disease of the stomach, but they are generally resorted to at too late a period. They seem to be better adapted to obviate the incipient affection of the stomach than to restore its exhausted powers, or to arrest the decomposition which takes place in the advanced stages."* I need say nothing of their use in the last stage of fevers, when the whole class of stimulantia (external and internal) become necessary to rouse the sinking powers of life. Blistering in such cases often produces admirable effects.†

Fifth. *Salivation.* As a simple and exclusive evacuant in the cure of fevers it is not to be relied on. As a depleting remedy it is slow in its operation, uncertain and unpleasant in its effects.‡ In the *first* stage of inflammatory fevers it is not admissible if the mercury be given in such a manner as to determine its operation to the mouth. The stimulus thus exerted upon the whole system, adds to the stimulus of fever, and more than counterbalances the good to be expected from the inflammation of the salivary glands. From a general law of the animal economy it is moreover extremely difficult to determine the mercury to the mouth during a high state of arterial excitement,‖ and when, perhaps, peculiar circumstances render it most necessary. Dr. Rush has spoken of a blistering point in fevers: the fact holds good

* Medical Repository, Hex. i. vol. ii. p. 395, 3d edit.

† "In ardent fevers blisters are best applied after the abatement of the heat, and when the pulse begins to flag, except in cases of local inflammation being an attendant, and then a blister applied over the part affected affords considerable relief."

‡ Dr. Chisholm placed much confidence in the cure of the Boullam fever at Grenada by salivation; yet he acknowledges he lost one in twelve patients. At Philadelphia and Baltimore, during the prevalence of the yellow fever in the same year in which it proved so mortal in Grenada, not more than one in fifty died under a different treatment. Facts speak for themselves.

‖ This law does not admit of the existence of two *dissimilar* actions in the system at one and the same time, provided they be of *equal* force. Hence it is barely possible to excite a salivation in the first or inflammatory stage of fever; and from this circumstance mercury will sometimes remain dormant in the system until the arterial excitement is overcome by nature, or the use of depleting remedies.

when applied to the exhibition of mercury with a view to excite salival discharge. Few person can doubt the powerful influence of salivation in overcoming *general* morbid action; but mercury, like all other valuable remedies, *must be adapted to the state* of the system. Its effects in this way need no explanation, for they are analagous to many simple operations both of nature and art.

Sixth. *Cold water, cool drinks, and cool air.* Under this head I shall confine myself principally to facts.

Previous to my having seen Dr. Jackson's treatise on fevers, or reading Dr. Rush's work on the yellow fever of 1793, I was induced to use the cold bath in the fevers of this climate, from having frequently seen the good effects of the partial application of cold water in inflammatory headach. In great determinations of blood to the head, producing violent pain and delirium, I have known the local application of cold water, by means of napkins, remove all the symptoms.* Preternatural heat is one of the most prominent and distressing symptoms of fever. Cold water acts by abstracting it from the body; thus lowering the pulse, and preventing the ill effects of a hurried circulation. Dr. Rush remarks,† "I was first led to the practice of the partial application of cold water to the body, in fevers of too much force in the arterial system, by observing its good effects in active hemorrhages, and by recollecting the effects of a partial application of warm water to the feet in fevers of an opposite character. Cold water, when applied to the feet, as certainly reduces the pulse in force and frequency as warm water applied in the same way produces contrary effects upon it. In an experiment which was made at my request by one of my pupils, by placing his feet in cold pump water for a few minutes, the pulse was reduced twenty strokes in a minute, and became so weak as hardly to be perceptible." In cases of not unusual violence, the application of cold water to the head, face, arms, and hands, may suffice; but where it has been thus used, and I have failed procuring a remission of fever by the aid of the more ordinary remedies, I have had my patients wrapped in a sheet or blanket dipped

* "Of all the parts of the body," says a late writer, "the head receives most benefit from the affusion of cold water; this is a simple and effectual remedy against too great an impulse of blood towards the head, where persons are threatened with apoplexy, in disorders of the brain and cranium, in wounds, and other complaints to which the head is subject."

† Volume iii. page 287.

in cold well or spring water, renewing it every fifteen, twenty, or thirty minutes, *pro re nata*, or until the abatement of heat. In thus using it we should, as nearly as possible, apportion the degree of cold to the febrile heat. This is to be regulated by the judgment of the practitioner. Where the heat much exceeds the healthy excitement, a more frequent renewal of the cold application becomes necessary. It is asserted by Paulus, that " the heat may be extinguished by cold water, by which we have wholly cured burning *fevers*." And again he observes, " the cold bath alone is of use to those who labour under an ardent fever, without an inflammation, tumor, or an erysipelas."

This practice, upon a superficial view, or to those who are unacquainted with the present generally received theory of fevers, may seem rash and hazardous; but it is justified from the correct doctrine of such affections, from analogical reasoning, from the experience of ages, as well as from the success which has lately attended it.* The event of the first case in which I ventured to use the cold bath dispelled fears, and established its credit.

Case 1*st.* A boy had laboured under the usual remittent of this climate for several days when I was called to attend him. Finding the common treatment ineffectual, and the vital powers apparently yielding to the excess of the stimulus, I advised him to be wrapped in a blanket dipped in water immediately from a well in the yard, and to repeat the process every half hour. With scarce a hope of its proving serviceable, or arresting the progress of disease, I left him. A remission took place in a few hours afterwards, and, to the astonishment of the family, he walked across the room next morning. It is worthy of remark, that when this remedy was directed the symptoms were altogether so alarming, that preparations were actually making for his death. No other remedy was used until his convalescence (which was speedy), when the bark and elixir of vitriol were given.

Case 2*d.* I was called to see a lad at the distance of twelve miles, who had been ill for ten days. I found him delirious, and his head, arms, and hands much convulsed. He was unable to swallow, and he had not spoke for the last twenty

* It does not admit of a doubt at the present period of medical knowledge, that the small-pox is a synocha tending to produce a dangerous state of excitement. The ill consequences of the old mode of treating it are known to every observer, and the success of the present cold method established beyond all cavil.

hours. His pulse was full, strong, and frequent, and the heat of the skin extreme. I proposed venesection, which was objected to by his parents. His inability to swallow rendered the exhibition of cathartics or other medicines inadmissible. Having little confidence in any other remedy, I directed nothing but the cold baths, which I first had applied by means of a towel to his head. He soon became more tranquil. I then had him placed in the centre of a large room, between two doors, admitting a brisk air, and upon a hard bed. He was now wrapped in a blanket wrung out of cold spring water. His pulse in a very short time became less frequent, and the heat diminished. Being obliged to leave him, I directed this treatment to be rigidly pursued. I did not see him afterwards, but was informed by his father that the alarming symptoms were entirely removed by the continuance of the cold water alone; that he very speedily got better, and in a few days rode several miles.

The above two cases are selected from many in which I have witnessed the unequivocal good effects of cold water in overcoming inordinate arterial action.

A case has been related to me of a person who was cured of a burning fever by escaping the vigilance of his nurses, and lying for some hours in a stream of cold water. And Mr. Bruce says the people of Massuah cure the most violent bilious fevers by permitting the body to lie for some time in cold water.

I could adduce many other instances of the benefit resulting from the application of cold water in the removal of local and general affections, arising from excess of arterial force; but the above may suffice, and they furnish useful hints.

The practice of using cold water externally in febrile diseases, though now somewhat novel, was not unknown to the ancients. Ætius advises that the cold applications be only used in the violence of the exacerbations. This caution is a proper one. Galen also speaks in the most sanguine terms of the usefulness of cold water in the *causus*. In fevers of too much action it ought rarely to be dispensed with; and as a remedy in local inflammation its value has long been known. Dr. Rush has informed us that cold water, applied in various ways, aided very much the success of his practice in the yellow fever; and to his getting wet in a rain he attributes the removal of feverish symptoms arising from the miasma of that disease. Immersion, or wrap-

ping the patient in a sheet or blanket dipped in cold water, has a very decided advantage over affusion. The latter is adapted to give strength and elasticity to the muscular fibres; and where the system is already labouring under the excess of stimulus, the suddenness of the application might excite a fatal determination of blood to some internal part.* This is what we should endeavour to obviate in fevers. When the water is applied in the manner I have advised, it gradually abstracts the heat from the body, diminishes the frequency and force of the pulse, relieves the internal parts, and thus promotes an equable perspiration, which seldom fails to prove critical.

To conclude, in the words of Dr. Miller, "as a means of carrying off heat, and of dissolving the catenation of morbid actions which forms the essence of fever, this remedy can have no superior."†

Those who admit the safety of the external application of cold water in fever, will not object to it as a drink, except during the immediate operation of an emetic or cathartic. It aids in the abstraction of heat, thus relieving thirst and promoting perspiration. It does more; it quiets the uneasy longing which most persons, particularly children, have for cold water, and in this way takes off a considerable stimulus of fever. Either pure water, lemonade, tamarind or apple water, may be drank, as the patient may choose. In general the subacid drinks are preferred, because they are most agreeable to the taste.‡

The practice of giving cold water in fevers was in general use among the ancients, and continued for fifteen hundred years. It is frequently mentioned in their works. Hippocrates has observed, "If the patient be very thirsty, while labouring under an *acute fever*, cold water is of great use if given till it makes him vomit." The same practice was pursued by Celsus. He directs it not to be given before the fourth day, when the fever is at its height, when it should

* It is to be lamented that the different *modes* of using cold water have brought some discredit on the remedy. The effects to be produced will depend upon this mode. The words of Dr. Rush deserve to be remembered. "In fevers of too much action, it reduces the morbid excitement of the blood vessels, provided it be *applied without force*, and for a considerable time, to the body. It is in the jail fever, and in the second stage of the yellow fever only, in which its stimulancy and tonic powers are proper."

† Medical Repository, Hex. i. vol. ii. p. 396, 3d edit.

‡ May they not have a tendency to correct a vitiated, perhaps a putrescent tendency of the bile?

be taken copiously, to cool the stomach and præcordia, and, if necessary, to excite vomiting. By this treatment a sweat is commonly brought on, which, he observes, affords speedy relief. A similar practice is still pursued in Italy. Galen says, " Cold water is a perpetual remedy against the fever itself." He directs it to be used both in ardent and putrid fevers; and if the copious drinking of it be not sufficient, he advises the patient to be put into the cold bath. In addition to these facts we have the respectable and undoubted testimony of Dr. Rush, of the efficacy of cold drinks in inflammatory fevers. Speaking of yellow fever, he observes, " I have nothing to add to the observations I have elsewhere published upon the efficacy of cool air and cold drinks in this fever. They were both equally pleasant and useful, and contributed, with cleanliness, very much to the success of my practice." In allowing our patients the liberal use of cold water in fevers, we act in conformity to the dictates of nature, and her admonitions are not always to be unheeded, although she is sometimes fickle and irregular in her operations. I have had several well attested cases related to me of persons who were almost immediately relieved in burning fevers by drinking largely of cold water, which was procured clandestinely; and repeated instances of its safety and utility confirm to me its superior efficacy to all the heating teas with which patients are too often deluged by ignorant and prejudiced nurses. All the good effects resulting from cold drinks in fevers may be, in some measure, expected from the frequent use of clysters of cold water.

Governed by similar views that direct to the depleting mode of curing fevers, and to the use of cold water, we should advise the free admission of cool air into the apartments of the sick; and from the air in them sooner becoming unfit for the purposes of life, we derive an additional argument for its use. The fear of its preventing perspiration is ill founded. When the heat of the system is increased to more than its healthy state, it is as difficult to excite perspiration as when the excitement is below the ordinary standard of health.* We have the authority of Dr. Cullen, that cold air acts as a sedative, and thus may be useful by abstracting the reaction of the vascular system ;† and the addi-

* " As in the small-pox, so in every kind of *fever*, the great design of medicine is to reduce the patient's heat to that degree which constitutes his healthy state."

† See his First Lines, vol. i. p. 94 and 119, New-York edit.

tional testimony of Dr. Rush of its utility.* As I before remarked, the small-pox is a fever of a highly inflammatory nature; and who does not know the necessity of cold air to ensure a favourable termination? Heat never fails to aggravate the disease, and even in winter the admission of cool fresh air into the rooms of the sick is indispensable.† In fevers attended with a local inflammation of vital parts, it may with some be a doubtful remedy. But I have heard of a person who was cured of a pleurisy in winter, by being exposed to the air of a cold room, with only the covering of a sheet.‡ I would not from this case infer that a similar practice would invariably be attended with a similar result; but it will aid in supporting the arguments which have been advanced, that cool air is a remedy of the first importance in fevers, except where there is an unusual chilliness at the time; and, like cold water and cool drinks, it is always soothing to the feelings of the patient.

The success which has attended the use of alkalies in bilious and malignant fevers (see the several volumes of the Medical Repository), sufficiently warrants the warm recommendation of them by Dr. Mitchill, and justly entitles them to rank among the auxiliary, if not the principal remedies of fever. I forbear to swell these observations by a recital of particular cases or remarks on the different forms of alkalies, or the peculiar mode of administration. The good effects which I have generally experienced from their *liberal* use, has established a confidence in their efficacy, and, in my opinion, places them among the valuable articles of the Materia Medica.

* Medical Inquiries and Observations, vol. iii. p. 284 and 285.

† "The fittest degree of heat," says the great Sydenham, "to promote the expulsion of the variolous matter, is the natural one, and such as is suited to the temper of the fleshy parts, and whatever exceeds or falls short of it is dangerous on either hand."

‡ Is it not probable that in this case the sedative effects from the continued application of the cold air overbalanced its stimulating ones?

CASE *of* INFLAMMATORY REMITTENT FEVER, *illustrating the Effects of* BLOOD-LETTING. *Read before the Georgia Medical Society, September* 1, 1804, *by Dr.* JOSHUA E. WHITE, *of Savannah.*

A Young man, in the vigour of health, somewhat of a robust habit, who had been but a very short time from Europe, was attacked, on the 23d of July last, with the usual symptoms of remittent fever.

On Tuesday, the 24th, he was visited, took a dose of the mercurial purging powder, and, his pulse indicating it, about twelve ounces of blood were taken from the arm.

Wednesday, 25th. Similar symptoms continuing, sixteen ounces of blood were taken from him; and on the following morning he lost twelve ounces. From this time until Sunday evening, there was no material or permanent alteration in the symptoms, and finding his pulse to be still full, frequent, and remarkably tense, I took sixteen ounces of blood from him. During the whole of the above period he took different laxatives, which, though they operated on the bowels, produced no change in the arterial action. On Monday morning, the 30th, he was bled to the quantity of sixteen ounces. It will here be necessary to observe, that he was bled in a supine posture, and the evacuation always continued until a paleness was produced in the face, or the pulse reduced in force, fulness, or frequency. The two first were always effected, but it as invariably rose soon after the arm was tied up. Notwithstanding the use of various febrile remedies, cathartics, diaphoretics (among which may be mentioned the long famed powder of Dr. James), and epispastics at different times, the symptoms continued to progress with an exacerbation every afternoon; and on Saturday morning, the 4th of August, he was slightly comatose. This was the thirteenth day of his illness. At four o'clock in the afternoon the symptoms of congestion in the brain had increased to an alarming degree, and it was with some difficulty he could be roused from his lethargic state. It will be recollected that he had not been bled since Monday morning, and during this lapse of time it was clearly seen that the disease was every day gaining ground. His pulse evidenced an unusual degree of excitement, and I can safely say I have never seen one wherein the symptoms of *excessive inflammatory action* were so strongly marked. The objec-

tional testimony of Dr. Rush of its utility.* As I before remarked, the small-pox is a fever of a highly inflammatory nature; and who does not know the necessity of cold air to ensure a favourable termination? Heat never fails to aggravate the disease, and even in winter the admission of cool fresh air into the rooms of the sick is indispensable.† In fevers attended with a local inflammation of vital parts, it may with some be a doubtful remedy. But I have heard of a person who was cured of a pleurisy in winter, by being exposed to the air of a cold room, with only the covering of a sheet.‡ I would not from this case infer that a similar practice would invariably be attended with a similar result; but it will aid in supporting the arguments which have been advanced, that cool air is a remedy of the first importance in fevers, except where there is an unusual chilliness at the time; and, like cold water and cool drinks, it is always soothing to the feelings of the patient.

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‡ Is it not probable that in this case the sedative effects from the continued application of the cold air overbalanced its stimulating ones?

Case of Inflammatory Remittent Fever, *illustrating the Effects of* Blood-letting. *Read before the Georgia Medical Society, September* 1, 1804, *by Dr.* Joshua E. White, *of Savannah.*

A Young man, in the vigour of health, somewhat of a robust habit, who had been but a very short time from Europe, was attacked, on the 23d of July last, with the usual symptoms of remittent fever.

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Wednesday, 25th. Similar symptoms continuing, sixteen ounces of blood were taken from him; and on the following morning he lost twelve ounces. From this time until Sunday evening, there was no material or permanent alteration in the symptoms, and finding his pulse to be still full, frequent, and remarkably tense, I took sixteen ounces of blood from him. During the whole of the above period he took different laxatives, which, though they operated on the bowels, produced no change in the arterial action. On Monday morning, the 30th, he was bled to the quantity of sixteen ounces. It will here be necessary to observe, that he was bled in a supine posture, and the evacuation always continued until a paleness was produced in the face, or the pulse reduced in force, fulness, or frequency. The two first were always effected, but it as invariably rose soon after the arm was tied up. Notwithstanding the use of various febrile remedies, cathartics, diaphoretics (among which may be mentioned the long famed powder of Dr. James), and epispastics at different times, the symptoms continued to progress with an exacerbation every afternoon; and on Saturday morning, the 4th of August, he was slightly comatose. This was the thirteenth day of his illness. At four o'clock in the afternoon the symptoms of congestion in the brain had increased to an alarming degree, and it was with some difficulty he could be roused from his lethargic state. It will be recollected that he had not been bled since Monday morning, and during this lapse of time it was clearly seen that the disease was every day gaining ground. His pulse evidenced an unusual degree of excitement, and I can safely say I have never seen one wherein the symptoms of *excessive inflammatory action* were so strongly marked. The objec-

tions which for some days had been made to the further use of the lancet were now relinquished, and I took from him twenty-two ounces of blood; at eleven o'clock he lost twenty ounces, and on Sunday, the 5th, at seven A. M. eight ounces.

In these three bleedings the blood had the appearance of lotura carnium, noticed by Dr. Rush to indicate the third degree of inflammatory diathesis. The coma now subsided, but the arterial action was yet too great; for his pulse in the afternoon was frequent, full, and tense. Eight ounces of blood were drawn, which quantity was repeated on Monday morning; and for similar reasons, and with the like view, ten ounces were taken on Tuesday morning. In the three last evacuations the crassamentum sunk to the bottom of the bowl; the serum was yellow, and deposited particles of a red and fiery colour, indicating an inflammatory action of the fourth degree of violence, beginning with the highest. The fever continued with marks of diminished action until Thursday morning, when, finding his pulse more full, tense, and throbbing, with an increased heat of the præcordia, I drew about ten ounces of blood from the arm, which, as usual, lessened the arterial force, and produced a moisture on the surface. After this bleeding, for the first time he sat up without a disposition to faint.

I had not an opportunity of seeing the blood after it became cool. It ought to have been mentioned, that on Sunday, the 5th of the month, he began to take the mercurial powder, and on Tuesday his mouth was slightly affected. The calomel was continued: on Friday the quantity was lessened, and the day following it was directed to be discontinued. On Sunday he spat considerably. Notwithstanding this favourable circumstance, and though his mouth was now very sore, the force of arterial action was yet strongly marked, and pointed out the necessity of further evacuations. His pulse had been at ninety for several days, and somewhat tense and full. On Monday it was more so, beat one hundred in a minute, and his countenance was somewhat flushed. Took twelve ounces of blood from the arm. This removed the inordinate excitement in the arterial system; nor did it become necessary to repeat the bleeding until Thursday, the 16th, when, finding his pulse rather fuller and more tense, it was thought advisable to take away ten ounces.

On Saturday, the 18th, his pulse was yet somewhat full and chorded, and beat one hundred and two strokes in a mi-

nute; his skin was also too warm. Having often remarked the good effects of cold water in such febrile affections, I directed him to be wrapped in a sheet wrung out of it, and to repeat it every two hours. My mode of using it was to have him stripped, and the cloth continued round the body until it became heated, which it did in ten minutes; it was then removed for ten minutes longer, when it was omitted for the space of time above mentioned.

On the succeeding morning his pulse was reduced to eighty-three, and much less tense and full. The cold cloth was directed to be continued at longer intervals, and the same practice pursued on Monday. He was now observed to be more free from febrile symptoms than he had been from the period of his attack, and he was therefore directed to take tonics. He continued convalescent from this period.

REMARKS.

I have elsewhere noticed, and it is not a novel observation, that persons from the Northern States and from European climates, are most liable to be attacked with the usual endemic of the season the first summer of their residence; and that the disease generally evinces a much greater state of inflammatory action in the vessels, than in those who are natives, or have resided more than one year in the State. Hence, in one sickly season the comparative number of deaths is much greater among the former than the latter. The subject of the above case was one in whom we might expect to find symptoms of violent arterial action. As I before remarked, he was young, plethoric, and arrived from England early in the month of July.

From the result of the above case I would not mean to infer that bleeding would invariably cure all inflammatory fevers, but I would adduce it as a new proof in support of the following positions.

1st. That we are not to be prevented from the liberal use of the lancet by the state of the weather; for in addition to the facts furnished by Galen and other ancient physicians, and by Sydenham, Hillary, Cleghorn, Moseley, and others among the moderns, it is well ascertained that the debility of the system in the hot months is of the indirect kind; consequently it is most effectually and speedily removed by depletion.

2d. That an evident appearance of great debility should not deter us from the liberal use of the lancet. The cause

of this apparent weakness is well known; and every physician must have noticed the increase of strength immediately after bleeding, and the facility with which his patient could bear motion without inconvenience. The patient whose case has been just related, complained of much greater weakness in the first week of his illness, than he did in the third. The reason is obvious. He was not bled in quantity sufficient to unload the vessels and relieve the pressure upon the "sources of strength:" hence the bleedings merely acted as a palliative; and hence arose the dangerous symptoms on the thirteenth day of his illness, which were only removed by the loss of fifty ounces of blood in fifteen hours. It was not until after he had been bled twelve times, and lost one hundred and sixty ounces of blood, that he could be removed from the bed without fainting.

3d. After he had been bled seven times, and the high state of excitement in a great measure overcome, the successive bleedings never failed to produce a copious and universal perspiration, and a sound and easy sleep. It also paved the way for the speedy effect of the mercurial powder on the salivary glands; for early on the third day after the use of it was commenced, his mouth was affected.

4th. That a disposition to faint from the loss of a few ounces of blood in the early stage of fever, is an additional proof of the necessity of further evacuation. This disposition in the above case was more evident in the first five bleedings than in the last nine.

5th. How many lives have not been lost from the prejudice which has attended the use of the lancet after the fifth, seventh, and particularly the ninth day of disease! In the above case we see how long the inflammatory action may be protracted in some cases, particularly where it has not been effectually overcome at an early period. Blood was drawn with the most evident benefit on the twenty-second and twenty-fifth days of his illness.

6th. The quantity drawn shows how much may be taken with safety in certain cases; and, agreeable to the judicious observation of the enlightened Rush, what danger attends that "half-way practice of moderate bleeding" in cases where, from excessive arterial excitement, no time is to be lost.

7th. The appearances of the blood which I have noticed substantiate the remark of Dr. Rush on this subject, and show how much may be learned from attending to the blood in ascertaining the state of the system.

8th. The inefficacy of the usual remedies of fever was remarkably exemplified in the above case; and the advantages of the repeated bleedings in reducing the inflammatory state of the system were so decided as to warrant all that has been said of it by Dr. Rush in his elaborate and ingenious defence; to justify the high expectations which have been formed of this safe, easy, speedy, and effectual remedy; and to induce me to persevere in the use of it in defiance of popular or vulgar opinions, or the prejudices of scholastic education.

A Case *of* Tetanus: *Communicated by* James Archer, *M. D. of Harford County, Maryland, in a Letter to* Elijah Griffith, *M. D. of Philadelphia.*

On the 7th of February, 1805, I was requested to visit a servant belonging to Mr. B. W. but being absent on professional duty, did not attend till the day following. The patient is a Negro girl, about twelve years of age, rather corpulent and robust, and exceeding in size most of her sex at the same period of life. She complains of severe pains in her back and neck, which are attended with frequent involuntary retractions of the head, neck, and back, constituting what has been termed by nosologists Opisthotonos. Her whole muscular system seems to partake more or less of the same diseased action. The extensors and flexors of the superior and inferior extremities are all in a state of spastic rigidity. She is perfectly in her senses; somewhat faultering in her speech; pulse but moderately full and soft; respiration a little hurried, and apparently oppressed by such violently convulsive and painful muscular motions. She sweats profusely; heat of the skin natural; habit of body regular; the retraction of the head, back, and neck occurs at least a dozen times in a minute: she can open her jaws but little, and that little with difficulty.

Upon inquiring into the progress of the disease, I was informed, that on the 28th of January ult. she first made a complaint to her mistress, of having a pain in the back, and to whom she frequently reported concerning the uneasiness; but as she was never disabled from duty, her complaints were scarcely noticed, till Sunday, the 3d of Febru-

ary, when the diseased motions of which I have spoken began to show themselves, and gradually to assume a more serious aspect.

Respecting the cause of the disease the patient can give no information. Conceiving the case to be an aggravated tetanus, inquiry was particularly directed to what accidents or injuries, however trifling, she had been exposed and suffered; and was informed, that about two weeks ago she had fallen with a log of wood upon her shoulder; that in the fall the back was the only part hurt. I examined her in toto, with minuteness, but without discovering the least suspicious marks of injury. Perhaps it may not be irrelative to mention that she had been bitten by a venomous snake in September last, on the top of one of her feet, which gave great pain, and swelled to the knee. Of this, however, she was soon cured by simples. Till this occurrence she has been always very healthy. The owners of the girl thought her disease proceeded from worms; while their neighbours said they were either "growing pains," or of a rheumatic nature. She lost a pint of blood on the 5th inst. took a dose of salts, and liberally of warm teas; but from which no benefit was obtained.

TREATMENT.

Feb. 8th. Ordered ℥j of yellow bark in divided doses, with lbjj of Madeira wine, and the occasional use of some grog every twenty-four hours; also two grains of opium immediately, and one grain, with two of stramonium, made into pills of the seeds, to be repeated every three hours. In addition to these medicines, a tea-kettle full of cold spring water was directed to be poured upon the neck every four hours, in such a manner that it might run down the back.

Feb. 9th. The bark and wine were not procured for six hours after I saw her yesterday. In half an hour after taking the first dose of opium, its effects were no less astonishing to the attendants than pleasing to herself and physician. She talked lively, intelligibly, and with gratitude of his skill in relieving her. All the spasmodic and convulsive symptoms ceased; her joints became limber, and she slept soundly for the last twenty-four hours, except when waked to take medicines. Her mistress suspecting the pills had caused her to sleep, gave no more, and she took neither wine nor bark in sufficient doses. Ordered a continuance of bark, wine, and cold water, as before, with one grain of stramo-

nium every three hours, and if spasms recur, also one grain of opium with each dose of stramonium.

Feb. 10th. The spasms have returned with as much severity as heretofore. Deglutition now difficult; almost strangles when she swallows the pills, even in solution. The bark and wine have been taken in very inconsiderable quantities. Allows the cold water to be poured on her without being the least affected, or seeming to know it. She feels no pain; pulse weak and frequent; tongue dark and dry; urine and fæces are discharged as in health; face often looks contracted; jaws occasionally clinched; joints stiff; her mental faculties unaffected. Ordered one grain of opium and two grains of stramonium as before, a continuance of the cold bath, and fifteen drops of the tincture of cantharides, prepared agreeably to the Edinburgh Dispensatory, every hour till the occurrence of strangury, or pain in the stomach and bowels forbid its further exhibition.

Feb. 11th. The patient's pulse is more feeble; tongue darker and dryer. When the examination of the tongue was made, the jaws clinched upon it, occasioning pain, and drawing blood. Deglutition so difficult as sometimes almost to produce strangulation. She requires an erect posture before she attempts to swallow. Noise aggravates the spasms, as well as attempts to drink. The risus sardonicus now frequently seizes her, and gives her a ludicrous appearance. The pills afford a temporary benefit, though the tincture has produced no effect. Ordered a continuance of the pills, and thirty drops of the tincture of cantharides, with the limitations before mentioned; a large epispastic to the back, and a discontinuance of the partial cold bath. I this day made an incision, about eight lines in length, on the inner side of the soleus muscle; filled the wound with cantharides, and bound it up with a common roller.

Feb. 12th. The epispastic produced a good blister, of which she complains much. Strangury came on this morning. Her attendants compared her situation to a person affected with gravel. She has been recovering ever since this wished for symptom made its appearance; has not had more than two or three convulsive motions in the course of an hour; the abdomen has lost its tension; tongue, though still dark, shows a commencing redness on its edges, and is becoming moist; muscles of the lower jaw less contracted, but not altogether subject to the will; pulse stronger. Can take some nourishment. Ordered the tincture to be continued,

but in rather smaller quantities; a liberal use of cyder, wine, and bark.

Feb. 14th. The patient has relapsed into a worse state than at any former period; the spasms are incessant; jaws constantly clinched; strangury has disappeared; she slavers at the mouth, not unlike a person in a salivation; much wasted in flesh; blister is drying. Ordered another epispastic to the back, a continuance of the tincture of cantharides, and of the opium and stramonium pills. No complaint has yet been made of the incision in the leg.

Feb. 16th. Patient situated as on the 14th. The cantharides have no other effect than blistering the tongue. It is somewhat remarkable that she swallows cyder with but little difficulty, when she resists the use of every thing else. Ordered eighty drops of laudanum every two hours, and forty drops of the tincture of cantharides every hour.

Feb. 18th. Pulse thread-like; habit costive; otherwise situated as yesterday. Ordered a purgative enema. Have omitted the cantharides from its distressing effects on the mouth, and allowed the laudanum after a passage is procured.

Feb. 20th. The patient voids urine involuntarily; takes neither medicine nor nourishment; abdomen evidently swelled and remarkably tense; her countenance truly hippocratic. She can still swallow cyder. The enemata have but imperfectly operated. Ordered a continuance of the enemata. I despair of saving the life of this unfortunate sufferer; but rather than be an idle spectator of Death executing his ruthless commission, I recommend the universal cold bath for half a minute each time every morning and evening.

Feb. 22d. Though the spasms still continue, yet the patient takes more notice at all times. She is delighted with the cold bath. To my agreeable surprise she took at least half a gallon of cyder the last twenty-four hours, some spirit, and a little nourishment. The enemata have operated. Ordered the cold bath three times a day, a minute each time. I now directed the temperature of the water to be diminished by the addition of snow. Forty drops of laudanum every three hours: injections as occasion may require.

Feb. 24th. The patient situated as on the 22d. Continue the remedies.

Feb. 26th. She is freer from spasm and all other diseased symptoms than for eight days past. The parotid glands are very much enlarged, and painful. Their swelling com-

menced on Sunday, the 24th inst. and has now increased to an enormous size. Since the accession of this anomalous symptom, she can swallow with more ease than heretofore; can even swallow in an horizontal position, which I have not previously witnessed. Uses nourishment plentifully, and also cyder. Ordered large emollient poultices to the parotid glands, two grains of calomel every three hours till the bowels be freely purged. Pulse full and soft. I directed the omission of the cold bath.

March 1st. The poultices have relieved the pain, and the swelling of the parotids, which threatened suppuration, has nearly disappeared. She has a voracious appetite; deglutition natural and easy; spasms are trifling, and occur but seldom; she is universally stiff, but in a less degree than at any former period; tongue moist and red, and can at most times open the jaws with ease. Ordered a free use of toddy, which she now seems fond of, the occasional use of mercury as a laxative, and for the spasms opium and stramonium.

March 3d. She sits up to-day, eats, drinks, and is cheerful; have allowed a discontinuance of all other medicines except a moderate use of bark and wine.

March 15th. Patient is perfectly well, has a good appetite, walks out, but is still weak.

P. S. December. I have frequently seen and heard from the girl during the last summer and fall; she was then, and still is in perfect health.

OBSERVATIONS.

The foregoing is a faithful account of the origin, progress, treatment, and termination of this case of tetanus. She is the third patient in this disease whom I have treated within the last three years. They have all terminated in health. The treatment pursued in the two first of these cases was *cæteris paribus* precisely the same as that which has been detailed in commencing the treatment of the case before us, viz. with bark, wine, opium, stramonium, and the partial cold bath. The same practice in the present case was used with a boldness and confidence of success which experience alone could dictate; but the inability of my patient completely to pursue this plan blasted my prospects from these heroic remedies. If experience had not convinced me of their efficacy in other cases of tetanus, I believe I would have used the tincture of cantharides, from the recommendations of Dr. Brown, of Kentucky, upon being first called

to the case. Her situation soon demanded a change of remedies. Cantharides were used, but with what effect let the foregoing history answer. I fear it will not prove so useful when tested by further experience, as we might *a priori* conclude. After using it liberally for about six days, the only symptoms occurring which might be attributed to its operation, were a blistering of the tongue and mouth, and a strangury of but little moment in force or duration. The accession of this latter salutary symptom was during the operation of an epispastic. Was then the strangury effected by the tincture or the epispastic? I suspect the latter, from the short duration of the strangury, notwithstanding the exhibition of the tincture afterwards. Perhaps the inability to re-produce this symptom should be attributed to the typhous state of the disease. This opinion receives some confirmation from a knowledge of the feeble operation of stimulants in typhus, as well as the difficulty, nay, impossibility, of producing a ptyalism in low states of fever. If this reasoning be just, the earlier recourse is had to cantharides the better. If it be deferred, the physician will, perhaps from this cause alone, be confounded in his expectations.

It would be difficult for any person who witnessed this case, or peruses its treatment, to say what remedy had the most salutary agency in effecting the cure. Immense temporary advantage resulted from the opium and stramonium, while the like momentary homage was paid to the effects of cantharides in the form of strangury; but the universal cold bath and cyder seemed to lay a solid foundation, on which the superstructure of health was afterwards erected.

Is the patient's disease to be ascribed to the injury she might have received from the log of wood, or from the vicissitudes of the weather? I believe it rarely proceeds from the latter cause in this part of the country.

The utility of dilating wounds which have been the occasion of tetanus, I have twice witnessed. Whence this advantage? Is it from the complete division of the tendon, which may have previously only received a lesion; or from the pain excited by the incision, and the effects resulting from the subsequent application of irritating substances? A conjecture on the rationale of this operation induced me to make an artificial wound, and fill it with cantharides. The pain and irritation were considerable, but the advantages a nullity.

The occurrence of a swelling in the parotid glands marked the epoch of a favourable issue of the disease. This, so far as I know, is an anomalous symptom. Could the cold bath have given rise to it? The suppression of a free perspiration by spring water, rendered cold by snow, might have thrown the increased action of the capillaries upon some other part of the system; for she was frequently in a sweat immediately before immersion. If cold in the present instance have been the occasion of a determination to the parotids, might not similar determinations in tetanus to these, as well as other parts of the system, be brought about, with some prospects of advantage, by first bringing on a profuse diaphoresis, and while in this state plunging the patient into cold water, at or near the freezing point? It would perhaps be more effectually used if patients were confined in it for ten or fifteen minutes, especially in the first attack. Would not this long confinement be more effectual in reducing the morbid action of the muscular system? for this is the manner I presume it acts in affording relief. Sound judgment, however, would be required in the prescription of a remedy which might be attended with dangerous consequences.

An ACCOUNT *of the* YELLOW FEVER, *as it appeared for several Years in* AMERICA. *Written in Louisiana in April*, 1803, *by Dr.* JAMES SPEED, *of New-Orleans, and communicated to Dr.* MITCHILL.

I HAVE had opportunities of observing the autumnal bilious fever in the Federal City in 1795; in Norfolk, Virginia, in 1797; in Kentucky in 1798, 1799, and 1800; and in New-Orleans in 1801 and 1802; and am now fully persuaded that the yellow fever (commonly called) is but a higher degree of the common autumnal bilious fever of our country—the intestinal remitting fever so accurately described by Dr. Balfour in his very speculative treatise on Sol-Lunar Influence. Yet I do not think it at all strange that those who have been much conversant with old nosologists should treat of them as separate and distinct diseases: for, from innumerable circumstances, which may be owing to temperament, habit, occupation, diet, &c. besides those arising perhaps from some variety, as well as difference in degree, of the exciting cause itself, it is evident that the

stomach, the upper, middle, and lower regions of the bowels, the nervous and sanguiferous systems, the glandular secretions, perspiration, respiration, &c. are severally affected in very different degrees in different cases.

"Truth reconciles facts." I have often thought that if our subject was completely understood, the different and seemingly opposite modes of treatment which have at several times been laid down by various authors as successful in their hands, and which, I have no doubt, were so, would appear quite consistent.

The little practice I have had in those fevers, to say the least of it, has been successful beyond even my own calculations. Perhaps this is saying more than one ought of himself.

You see I write in haste. I have premised thus much as the shortest introduction to the few remarks I am about to make, to avoid the imputation of downright dogmatism.

Having read the essay of Dr. Balfour above alluded to, Drs. Rush and Moseley's treatises, and Mr. Bryce's account of the yellow fever on board the Busbridge, an East-Indiaman, before commencing the practice of physic, I always considered it a main point to unload and cleanse the bowels thoroughly and effectually. But I soon found it necessary to attempt this by very different remedies. In many cases the stomach was in such a state of inflammation or irritability, as to reject every thing taken into it; and every dose of physic seemed only to increase the vomiting. In such cases I had recourse to glysters of tartar emetic. In every instance of this kind coming under my observation, they have had the happiest effects; not only changing the reverted course of the peristaltic motion, but frequently evacuating completely the whole intestinal canal, without the aid of any other medicine. Sometimes, while the patient had regular stools, the stomach and upper regions of the bowels were greatly loaded and oppressed. Here nothing succeeded like vomits. In other cases the middle region of the abdomen was principally affected (with soreness and numbness), the stomach and rectum being at ease. In those cases jalap and calomel, and castor oil, succeeded well. Dysentery I considered as a modification of the same intestinal fever, and treated it with an emetic followed by nauseating doses, soothing the lower part of the bowels with emollient injections, and sometimes cold water. Believing that cholera morbus was but a similar disease of the entire canal, already

in a state of re-action, I administered nothing internally but what was soothing and cordial, but attempted to divert the violent flux of sensibility (if you will allow me that expression) from the bowels, by blisters to the extremities, and by friction.

Bleeding, which has been so indiscriminately employed by some, I have not by any means found necessary in all cases, and in very few except at the commencement, or in consequence of the improper use of mercury. It appears to me a fortunate circumstance, that, in the blind state of our art, those two remedies, bleeding and mercury, have been employed so much together. But notwithstanding I have not found it necessary to bleed in all cases, I can say with truth, that I have not witnessed a single instance of mortality wherein it was employed during the precursory symptoms. Indeed the same may be said for purging. But this, by the by, I have often had reason to believe, that many who have had the usual precursory symptoms in a slight degree, have had the attack suddenly brought on (which possibly they might altogether have escaped) by the use of these two remedies; yet I have never failed to advise them when the prevailing fever was violent or fatal, being well satisfied it is the safest plan; for though the attack is hastened, still the patient has the advantage of having struck the first blow. The only symptoms which I have thought always indicate the propriety of bleeding, are a tense or depressed pulse, suffused face, difficult respiration, and the febrile action of mercury when it has been administered.

Mercury is certainly a most excellent medicine in these fevers when properly used. As a purgative it is commonly too slow, and, in the first stage, too stimulant; but being preceded by copious purging and bleeding, it is above all others in restoring the glandular secretions, or rather perhaps excretions. Antimonials also answer this intention very well when the stomach is not disordered, or when it is not in an active state of disease.

I consider the cold bath as efficacious and beneficial as it is pleasant, when employed in the hot stage. A sort of wooden theory or notion of mine, that to combat the symptoms is, like killing the individual subjects of a hostile power, one way to gain a victory, has led me to employ this remedy with perhaps more than common freedom. Heat is often the most urgent symptom in these fevers; and in those cases the relief afforded by the cold bath is almost

miraculous. When the temperament has been so far above par as to be almost insupportable to the touch of another, I have, in several instances, reduced it to the healthy standard in less than twenty minutes, by pouring water from on high out of a pitcher on the head and down the back. This excessive heat, like every other symptom of the disease, is not always universal, but often confined to the head, breast, or belly. In those cases the more partial application of cold, by means of wet cloths, answers full as well, and perhaps better. Whether humidity has any great share in producing the beneficial effects of the cold bath is doubtful with me. I should suppose, though I have never tried it, that the warm bath ought to be the better of the two when the skin is very dry, without excessive heat. Query: Might it not have been in such a variety of the fever that Dr. Hosack and others found it so beneficial?

In that variety of the disease which we call Dysentery, when the bile is hot and acrid to a great degree, it is necessary to correct, whilst we remove, the contents of the bowels; for often the patient cannot bear such frequent evacuation as is necessary for the removal of that truly distressing symptom of burning in the rectum. Of all the remedies I have had recourse to, there is none answers this intention so well as columbo. Indeed, in all cases of bilious fever, of whatever description, when the evacuation of the bowels is slow and difficult, I have generally endeavoured to correct the acrimony of their contents by bitters, acids, or saline draughts. But how far these remedies have contributed towards the recovery of patients, it is impossible to determine. The giving of wine and bark with this intention, has ever been, according to my experience, not only useless, but highly prejudicial. It raises the temperature of the body, increases oppression, weakens the operation of medicines, and seldom fails to produce a disagreeable sense of constriction in the breast, and sometimes in the head.

Blisters have commonly been reserved till the latter stage of fevers, to keep up and to equalise the excitement when the excitability is almost exhausted. I am not prepared to decide on the propriety or impropriety of this practice, only so far, I have generally observed that cold, clammy sweats ensue very shortly after their application, when thus used. This has been owing, in great part possibly, to the stage of the disease, and not to the remedy. I think it is the celebrated Dr. Lind who advises the application of blisters to

the small of the back when there is violent pain in the region of the kidneys. The few cases in which I have witnessed their employment in that way would encourage me to a repetition of the practice. The very small quantity of urine voided when there is an engorgement of the kidneys, will deter most physicians from the use of cantharides; but when we consider that this symptom has its seat in the kidneys, and not in the bladder, we need not hesitate on that score. I have, however, observed one instance wherein the urine was excessively acrid, and inflammation actually took place in consequence, in the neck of the bladder and urethra. Here I was afraid of cantharides myself, and had recourse to mustard and to friction in their stead.

Friction appears to me a much better mode of restoring the heat, and equalising the excitement, than blistering. It operates more extensively, and, when used with force, and more partially applied, produces equal inflammation, with less pain and less evacuation. Besides, it gives a powerful mechanical aid to the languid vessels of the extremities.

Hiccough, when occurring in this disease, has proceeded, I can almost venture to say in every instance coming under my observation, from an overcharge of the stomach; and I have reason to believe that it would not be near so formidable a symptom if it was generally considered and treated as such. Its so frequently succeeding violent and long-continued vomiting has been the cause, no doubt, of this fact being so little known. But when vomiting has preceded, the hiccough does not immediately follow; and, without having recourse to a retrograde motion of the lower bowels to account for a replenishment of the stomach, we know that, in ninety-nine cases out of a hundred, the patient is so plied with drinks, antispasmodics, bark, wine, and stuffs, that an ordinary stomach may soon be filled with them; besides, the bowels, in these cases, are generally in an almost paralytic state, and the pylorus, of course, choaked up with their contents: the fact is, that a complete evacuation of the bowels will, for the most part, remove the symptom.

Most of the physicians of New-Orleans are much in the habit of prescribing mild glisters, and seem to suppose that a stool procured by this means is a sufficient evacuation. The paralytic state of the middle region of the alimentary canal is unaffected by such mild and partial remedies. When this feeble practice is too much relied on, the hiccough seldom fails to be a final symptom.

P. S. It is a matter of wonder with me that physicians have been so little attentive to the very great advantage and superior efficacy of bleeding in the access, and not in the recess of the paroxysms of fever.

A CASE *showing the Impropriety of taking the whole of the* VIRUS *out of a* VACCINE VESICLE: *Communicated by Dr.* FREDERICK DALCHO, *Secretary to the Medical Society of South-Carolina, to Dr.* MITCHILL, *April* 27, 1805.

ABOUT the latter end of May, 1802, I vaccinated two seamen; one of whom went regularly through the disease, accompanied with all the characteristic features of successful vaccination; the other, on the fifth day, had a very fine, prominent vesicle on his arm. On the following morning Dr. Noble and myself went on board, attended by our patients, to vaccinate them, and, to our very great disappointment, found that some physician had already been there, and taken every drop of lymph from the vesicle. The progress of the disease was immediately stopped; for, on the ninth day there was a hard scab formed, which, on the day following, fell off.

Depriving the vesicle of the *whole* of the virus appeared to have, in this case, the instantaneous effect of terminating the disease. Probably, in taking the virus, some injury might have been done to the true skin, which produced inflammation sufficiently strong to overcome the vaccine action, and form pus.* It appears then that the stimulus of the virus is necessary to be kept up until absorption takes place, and therefore that the practice of taking *all* the lymph out of the vaccine vesicle is hazardous, as the disease may be terminated before the system becomes affected, and consequently the object of vaccination is not answered. It would also appear, at least from this case, that absorption does not take place until after the fifth day.

Supposing my patient not safe from the variolous contagion, he was inoculated with fresh small-pox matter, and on the eighth day thereafter the usual symptoms of that disease made their appearance. At this time the inflammation in

* Dr. Garden, the physician who had taken the virus, has since informed me, that no injury was done to the skin in taking it.

the variolated part was very considerable, and two pustules were forming at the side of it. I gave him a strong cathartic, which operated very briskly. On the ninth day, as the fever ran high, I took from him near two pounds of blood, and repeated the cathartic. No eruption took place, other than the two pustules above mentioned; the fever subsided, and the patient declared himself well.

As no general eruption succeeded variolation, he supposed that the cow-pock had been the means of preventing it, but I am disposed to attribute it to the bleeding and purging.

The efficacy of depletion in the above case may lead to an important improvement in the treatment of small-pox. It does not appear to be indispensably necessary that eruption should take place. When the febrile action is established, it is an evidence of the general affection of the system, and numberless instances have occurred where no eruption succeeded variolation, and yet the patient has been secure from the future attacks of the disease. In every case then in which there was reason to suppose that the patient was labouring under an attack of natural small-pox, I would recommend copious depletion, both by bleeding and purging; and, in short, treat it in the same manner as any other highly inflammatory disease. The free admission of cool air, the affusion of cold water, &c. as practised with such success in the present improved method of treating this disease, is certainly of the class of the same remedies which I propose. No one, I suppose, would hesitate in the abstraction of large and repeated quantities of blood from a patient labouring under pneumonia until the action of the arterial system should be reduced to the natural standard. The disease of which I am treating is of the same type, and the same remedies are applicable to both in the first stage. Indeed, if fever is the consequence of the application of stimuli, it will hold good in a very large majority of cases.

P. S. Since writing the above I have met with Dr. Hillary's Essay on the Small-Pox, in which bleeding is very strongly recommended in that disease.

Efficacy *of the* Acetate *of* Lead *in* Hysteria *and* Chorea: *Communicated in a Letter from Dr.* Aaron C. Willey, *of Block-Island, to Dr.* Miller.

I READ with pleasure Dr. *Agnew*'s communication to you on the efficacy of the acetate of lead in epilepsy, inserted in Med. Rep. Hex. ii. vol. iii. p. 34. That this article of the Materia Medica is an important subduer of spasmodic affections I have long been of opinion. But I have not had an opportunity of giving it that trial in cases of *motus abnormes* I could wish, in order to ascertain its powers. The Doctor suggests that it might be used with advantage in hysteria and chorea. I presume, therefore, that the following account of a case in each of these diseases, successfully treated by this medicine, will not be unacceptable to him, or perhaps many of your readers.

Case of Hysteria.

A young lady of about twenty years of age, and full habit, was seized with an indisposition on the 5th of January, 1803, apparently arising from dysmenorrhœa. This daily progressing, terminated in a species of hysteric paroxysms on the 11th. As I was not at that time upon the island, a physician was called from the adjacent part of the country, who arrived the day the paroxysms commenced. He had recourse to those means commonly used on like occasions, but not with that ultimate benefit which usually results from such a mode of treatment. However, the symptoms of her disorder appearing to be mitigated, he left her on the 15th, with medicines and suitable directions. I returned on the morning of the 17th, when I found her labouring under those paroxysms, which had recurred with equal violence. They began their attack with an excruciating pain in the scrobicular region, which, in a few minutes, ended in clonic spasm upon the stomach, with a total deprivation of all voluntary motion. This continued from one to eight or ten minutes, being interrupted now and then only by a convulsive expiration and shrill groan. These left her in an extremely debilitated state, with constant tendency to swooning. A number of them would sometimes follow in quick succession. I combatted this disorder for two days with the usual agents, but in vain. The fits increasing in both frequency and force, I resolved upon a trial of the acetate of lead. I accordingly

began by giving it in doses of four grains every three hours, formed into pills with an extract prepared from the bark of butter-nut *(juglans cinerea)*. To my agreeable surprise the paroxysms ceased in eight hours from the first exhibition of this remedy. But in order to render the cure more complete, the acetate was continued till seventy-four grains were taken.

I have met with no case of hysteria since but what has readily yielded to the common remedies of practical writers. These I am in the habit of employing first, as I consider their impression upon the system to be more immediate than that of the acetate of lead.

Case of Chorea.

On the 20th of October, 1804, I was requested to visit a girl of about thirteen years of age, and of rather a delicate constitution. I found her labouring under an inflammation of the brain; but by pursuing the usual *modus medendi*, soon relieved her of the disease. In the beginning of January following she began to manifest irregular and convulsive motions of one foot, and presently after of both. On the 24th I was called upon to attend her. She was then labouring under the characteristics of chorea sancti viti. I adopted those remedies which seemed to promise the most salutary effect, but soon found them totally inefficacious. The disease rapidly increased, while I was vainly trying every medicine which had been used by others with any apparent benefit. Fatuity, injury of speech, and loss of voluntary motion were striking symptoms. The pains became exquisite, the convulsions alarming, and every exacerbation seemed to threaten immediate death. In this unhappy situation I had recourse to the acetate of lead. I administered it in doses of two grains every two hours. The effect was pleasing. The exacerbations immediately ceased, and the patient appeared to convalesce; but upon suspending the acetate for a short time the exacerbations returned; they, however, again vanished upon resuming its use. By persevering in this remedy almost every spasmodic symptom was gone in twenty days, and she soon so far recovered as to be able to make a visit into the country. I was particularly careful to preserve a free passage through the intestinal canal by cathartics.

In the course of the spring she was attacked with the hooping-cough, which was pretty severe. This brought on

a continued pain of the head, and a recurrence of the symptoms of chorea. I directed a powder of the root of *myrica cerifera* to be snuffed into the nose three or four times a day, in sufficiency to induce sternutation. This had the desired effect; the pain of the head was relieved, and the spasmodic affections disappeared.

This case not only furnishes us with a new remedy in chorea, but tends to corroborate the opinion of Dr. *Coxe*, that the disease is owing to a chronic state of *hydrocephalus internus.** That the above case depended upon an effusion in the brain is highly presumable, from its being preceded by phrenitis, and the occurrence of the pain in the head, accompanied with a return of the convulsive motions upon the accession of *tussis convulsiva*. It was upon this idea that I prescribed an errhine, in order to excite absorption by stimulating a branch of the lymphatics into inverted motion, agreeable to the theory of the ingenious author of Zoonomia.

REMARKS *on the* ORIGIN *and* CAUSE *of the* YELLOW FEVER, *and on the* MEANS *of* PREVENTION: *Communicated by Dr.* WILLIAM BAKER, *of Bladensburgh, Maryland, to* JOHN PINTARD, *Esq. Inspector of Police in the City of New-York.*

I OBSERVE in the public prints an invitation for the opinions of gentlemen upon the cause and means of preventing the yellow fever. A stranger to you all, I rest my remarks upon the plain exercise of common sense, and the facts upon which they are predicated. There seems to have been a strange and unaccountable fatality hanging round the subject of yellow fever from its first appearance to the present time. There has been a want of union among medical gentlemen, a want of united exertion in their researches, a dread of responsibility, and a pitiful temporizing indecision, which has unjustly stigmatized our country as "a source of pestilence" among foreign nations, and stamped an opprobrium upon the science of medicine in our country! Among the number of publications I have read upon the subject, I can find nothing satisfactory as to the cause of the disorder,

* Vide Med. Rep. Hex. ii. vol. ii. p. 1.

or any thing like a system laid down to prevent it. The following remarks are made to reach these objects. I am aware that I hazard much in the attempt; but I am conscious that I am disinterested—that I feel no wish for patronage from one part of the faculty—no terrors from the remarks of the other. More than thirty years practice in medicine entitles me to an *opinion* upon such a subject; and I am sorry to add, that the same experience proves that physicians are not less frail than other men. What are the causes of yellow fever in our large towns? and what are the probable means of preventing it? I shall lay down a few facts as undeniable.

1st. That the yellow fever has appeared only in such of our towns as are populous.

2d. That the disorder begins on flat grounds near docks.

3d. That the upper and back parts of the towns, not thickly settled, are seldom much affected.

4th. That the disorder begins after the hot weather commences, and continues so long as the weather remains hot.

5th. That the disease is more mortal in dry seasons, accompanied with heat.

6th. That in wet, cool summers the disease has scarcely appeared.

7th. That after a long drought and great heat, and when the disease had become more general and more mortal than usual, a considerable rain (and the air temperate), or a frost, will soon dispel the gloom of the people, and restore health to the city.

8th. That there is no instance where a patient labouring under the disease and carried into the country communicates infection. And,

9th. That a person in perfect health going from the country into the parts of a town afflicted with the disease, although he remains but two or three days, may contract the complaint, and feel its effects immediately, or after he has returned to the country, although he has not seen a person under the fever.

From the best information I have been able to procure, and from my own observations, the above are admitted facts. I take then these facts as my data; but before I make the deductions you must suffer me to remind you of other, no less certain, facts as to bilious fever in general, and which seem to me extremely material in their investigation; that

the fever going under the general name of bilious, is very properly divided into four grades, the intermittent, the remittent, the true bilious, and yellow fever; that they all prevail in warm seasons only; that wherever they do prevail, substances are found in a state of putrefaction; that this putridity will furnish certain noxious particles, which are called miasmata; that these miasmata are floating in the atmosphere, within a certain distance from the place where they originate; that the human body exposed for a time within the focus or column of atmosphere thus impregnated, will be afflicted with bilious fever; and that bilious fever has never been known to prevail without this cause, or this cause ever known to exist without producing it more or less. I appeal to the candour of gentlemen who practise in the neighbourhood of marshes, to prove these positions. I will not go back to the numberless old authorities which might be adduced, because they might be cited to prove any thing and every thing; nor will I quote in support of them, or combat a contrary doctrine, found in the innumerable remarks that have been published upon this subject in the United States.

I have an aversion to any thing like cavilling, or the parade of much quotation. I consider the eminence of a physician to consist not only in his knowledge of general principles, of cause and effect, but in his candour and experience, and, above all, in his talent to discern, to discriminate, and comprehend the indescribable characteristics of each case, so as to ascertain what the patient's complaint really is; so in finding a cause for yellow fever we must not only resort to general principles, to cause and effect, but to the particular situation in which it appears, the season, the weather: why the disease should appear in Baltimore, for instance, now it is populous, and was free from it while it was not populous, and the thousand other circumstances which must inevitably attend a proper inquiry, in order to form a just judgment. I say then, that yellow fever is a bilious fever of a higher grade, and that it is produced by the same cause, existing in an increased quantity, or by its being of a more deleterious quality than what is required to produce the other grades of bilious fever. This cause is the effluvia from vegetable or animal substances, or both, in a state of putrefaction. Whilst I am ready to concede, that vegetable putrescence is the most common cause of bilious complaints, and may, under certain circumstances, produce

even yellow fever; yet I cannot think that a sufficient quantity is found in our towns to produce more than one of the first grades of bilious fever.

But while the advocates for such a doctrine are searching in vain for vegetable stench sufficient to produce yellow fever, their sense of smelling will assign abundant cause for this malady in the exhalations from animal putrefaction, arising from an immense quantity of human feces collected in open wells and on the surface of the earth, through all the thick settled parts of our cities, and especially near the docks. Dr. Rush has told us that vegetable putrefaction is more apt to produce disease than animal! I will admit that it more *commonly* produces disease, because it is more general; because a river, marsh, or mill-dam are not so easily removed as putrid animal substances; but the great mass of medical authority certainly favours a contrary doctrine. I will meet the position, by stating one case out of a hundred which could be produced. A family live surrounded by marsh, where there is more vegetable putrefaction than can be found in any city in the United States. They have bilious fever in one of the first grades, but no yellow fever! They all recover. Another family, near the dock in Baltimore, at the same season, and under the influence of the same weather, will have lost at least half their number by the yellow fever. It follows then that there must be *something* in the *town* more mortal than in the *marsh*, and this cannot be vegetable putrefaction. It cannot be the number of people, because a much greater number in a less space are in garrisons and vessels, and no yellow fever; it cannot be the difference in the manner the two families live, because the town family live in the same manner at other times; it cannet be the heat, because the same heat is felt in the country, and by the inhabitants of the same town, who are healthy in a higher situation and thinner population; it cannot be imported, because the yellow fever comes regularly in the hot months, and ceases upon the approach of cold; because infectious diseases are caught in cold as readily as in warm weather; nay, infectious diseases are much more common in cold weather than in warm; witness the jail fever, chin-cough, &c. and vessels would be as liable, or more so, to bring the infectious complaint in the cold season; because no one contracts the disease from a patient who is removed from the atmosphere in which he had been enveloped; and because the healthiest man going into such an atmosphere does con-

tract the disease although he has never been in a house where the fever existed: undoubtedly then there must be a *something* which is local—a something which impregnates the atmosphere in populous parts of towns, and which must grow out of the population itself; because the same situation in the same town which now has yellow fevers, was healthy when it was thinly inhabited. This something I believe to be the human feces; and I do the more firmly believe it, because every fact, every circumstance, and every doubt which has attended the approach, the progress, the cessation, and the return of the fever, can be satisfactorily accounted for from this cause; and I do no less seriously believe they cannot be satisfactorily accounted for from any other. We all know as a city increases in population, so does the number of necessaries; and we know too, during the hot season these necessaries, on the thick settled squares, emit an effluvium which is extremely nauseous and offensive; and we know also, that this offensiveness is not perceived in thin settled towns, or even in the thin settled parts of populous towns. No one will deny that this offensive effluvium is putrid, and I believe no physician will say that yellow fever is not produced by putrid effluvia. I say then that the reason why this disease is confined to our populous cities is, that the quantity of human feces necessary to produce it cannot be deposited, or will not be collected in any place which is not populous; and I am bold to say, that every town upon earth which has attained this degree of population, or which may hereafter attain it, if the human feces be suffered to be collected in large quantities, and such town is subject to the same (or greater) degree of heat and drought which is found in the middle and southern States, will have yellow fever.

This is my reasoning upon the first fact stated in the forepart of this letter. The second, as to the place it first appears at, is no less in support of the same doctrine; because the low flat grounds near docks are generally most populous, the reservoirs for the human feces are shallower, the inhabitants are of a description less cleanly; such flat grounds not only become a receptacle for various kinds of putrid offal, as well vegetable as animal, which is brought by the rain from the upper parts of a town in the course of the cool season, but the want of declivity in such grounds adds greatly to the accumulation, by retaining such as are generated there; besides these reasons, the state of the docks themselves affords a powerful argument; all, however, going to

prove unequivocally, that the cause of yellow fever is to be found in putrid exhalation. The disease begins then of course where there is the greatest source of putridity, and where the heat can soonest operate so as to impregnate the incumbent atmosphere.

The third fact is explained by what I have already observed. The fourth and fifth go also to corroborate my theory.

Whilst you acknowledge that the fever never has appeared but in warm weather, you must recollect the known and admitted properties of heat, viz. that it produces putrefaction and evaporation. Hence then, as heat infallibly has this effect, it must follow that wherever substances are found capable of putrefaction and evaporation, the atmosphere near such substances must be impregnated with putrid miasmata, in proportion to the source to be acted upon. Now I would ask, what source can be pointed out in our large towns by any means so considerable as the human feces, which have been, perhaps, for many years collecting in the innumerable large reservoirs or wells assigned to the citizens? or where can be found a man of sense who will say that this source of putridity cannot produce the disease? It is a fact too, founded in reason and experience, that in all cases of drought, accompanied with heat, the miasmata taken up by the atmosphere are more active and more generally mortal; because they are not diluted by moisture floating in the atmosphere; because the column of impregnated atmosphere will extend itself; and because in other parts of a city containing the same source of putridity, though in a less degree, they may become active by a long continuance of heat and drought.

The sixth fact is still in support of my ideas; because, in moderately cool summers there is less evaporation, the air is less impregnated with miasmata, and, if the season is moist (which is almost always the case), such miasmata as are taken up are soon deposited or diluted, so as not to be active. And here I must make another remark, which is considered material; this is, that the fever has not appeared until the heat has continued for some time. How then, it may be said, is this accounted for? I answer, that the wells allotted for a deposit of feces are always covered, and many with brick walls; that they are placed in situations generally where the sun can have but a partial influence; of course it is not until the whole atmosphere is completely warmed that the putrid evaporation can become effective.

The seventh fact certainly proves that heat is the agent

which occasions this malady, and experience no less convinces that drought makes it much more mortal; it proves too, that cold is a preventive. If then those substances which heat is capable of acting upon are removed, the effect ceases: and I do again ask, what is there in our cities but human feces which is thus capable of being acted upon? or where is the man hardy enough to deny that your necessaries are extremely nauseous in hot weather and not so in the cool season?

The eighth fact is surely conclusive as to the doctrine of infection; and the ninth is no less conclusive that it is coming within the impregnated atmosphere, and not approaching the dying patient, which gives the disease.

In September, 1802, I was in both Philadelphia and Baltimore, and the disease was making great ravages. I went to see the docks, the streets, and the alleys, and I do aver they contained nothing to produce the disease; but it was by keeping my handkerchief to my nose that I could avoid vomiting, from the stench of the necessaries. Thus satisfied by the evidence of my own senses, I published some remarks, of a nature like the present, in a Baltimore paper, and the idea has been in some measure embraced; but instead of a fair and full experiment of filling up the reservoirs, and having the feces removed by scavengers every few days (as is done in Paris and other populous towns), we saw the lives of thousands—the prosperity of our towns, and commerce shamefully and wantonly sacrificed to a pitiful chemical experiment! a few pecks or bushels of lime are employed to *saturate* the noxious effluvia of from fifty to a hundred cubic feet of human feces! The Philadelphians (copying, no doubt, the police of London) have brought in water, but have strangely misapplied the advantage. They irrigate their streets, it is true, but they have found no benefit! And why? I answer, because the evil is in their back yards (where the water is never carried), and not in their streets; it is like washing a deep and sinuous ulcer on the outside, while the real remedy is to cleanse the bottom. The police of all the cities have been active to keep their streets clean—to establish quarantines—to guard, in short, by every means in their power, against a malady they know not how to account for; and they remind me of an anxious old gentleman, who in vain searched his house for his spectacles, and at length found them on his own nose! Habit has great influence on the senses of man, and perhaps in

none more than the sense of smelling. Your citizens, accustomed to the effluvia from necessaries, are not sensible of the stench; but bring in a countryman, and you will find him loud in his complaints. I am aware of an argument which will be urged against my theory, and will meet it by anticipation. It is this: Why, they will say, has not this complaint appeared before, when both Philadelphia and New-York have been populous, and some parts as much so for many years as at the time the fever appeared? I answer in the first place, New-York, Philadelphia, and Baltimore (where the fever has raged), after the revolutionary war increased in population beyond all example, and it was not less than ten years continual increase before the fever appeared so as to assume the shape of a general complaint; and even then, and at each succeeding appearance, the skirts of the city remained free from it. In the second place, what proof is there that yellow fever has not existed formerly in the thick settled parts of cities? I believe it has, and if physicians would be candid, a thousand instances might be produced; but these cases gave no alarm; and we do know that even after the malady had become general, that the citizens unwillingly admitted any extraordinary disease to exist! Now, I contend that none of these cities had reached that degree of population, or, in other words, there had not been a sufficient source of putrid feces before the year 1793 to make the disorder so general; besides, its appearance that year can be accounted for only from the long continued heat and drought; and every hot dry summer since, the fever has been renewed with the same violence; and every wet cool summer it has not appeared at all, or to a very moderate degree. A third reason why the disorder may not have appeared sooner as a general disease in the cities is drawn from the nature of the reservoirs. They are deep and capacious, and it is several years before they are filled so high as that the heat can operate.

Whatever may be thought of my reasoning as to the cause of yellow fever in our large towns, one thing is certain, that the necessaries are extremely offensive in warm weather, and the removal of them no less desirable in this country than has been found in Europe.

That your laudable exertions in preventing a return of the fever may be successful is my sincere wish.

REVIEW.

ART. I. *Tableau du Climat et du Sol des Etats Unis d'Amerique, &c.* i. e. *Picture of the Climate and Soil of the United States of America, &c. By* C. F. Volney. *In two vols.* 8vo. *Paris.* 1803.

ART. II. *A View of the Soil and Climate of the United States of America, &c. London.* Johnson. 1804.

ART. III. *A View of the Soil and Climate of the United States of America; with Supplementary Remarks upon Florida; on the French Colonies on the Mississippi and Ohio, and in Canada, and on the Aboriginal Tribes of America, &c. &c. Translated, with occasional Remarks, by* C. B. Brown. *With Maps and Plates.* 8vo. pp. 446. *Philadelphia.* Conrad & Co. 1804.

[Continued from Hex. ii. vol. ii. p. 420.]

A GREAT part of his theory being built upon the fact of there being a south-west wind on the other side of the great chains of mountains for ten months in the year, blowing warm from the intra-tropical region of the Gulf of Mexico, Mr. Volney has employed all his ingenuity and talent to prove it. Thirty-four pages of his book are occupied with the discussion. Upon the principle contended for in this part of the work, the probability, importance, and truth of his whole doctrine of the winds depends. He has, accordingly, laboured it with so much care, that it may be considered as the very marrow of all which he has written upon our climate. And that nothing might be wanting to elucidate the subject, he has caused an elegant coloured chart to accompany his description. In this the *yellow* shades denote the extent to which the deflected trade-wind is spread and diffused over the North-American continent. The north-west wind is partly expressed by a stripe of *green.* To this part of the work, extending from the 194th to the 228th page, we particularly refer our readers. Notwithstanding its interesting contents, its great length forbids our extracting it. And even should we give it entire, there would be difficulty in comprehending the details apart from the map.

Having thus treated at great length on the current from the south-west, as it occurs *in the* atmosphere, Mr. V. proceeds

to describe a current (p. 228), from nearly the same quarter *in the ocean*. This is the *Gulf-stream*, issuing from the Straits of Bahama, forming a singular sort of marine river, which runs at first four or five miles an hour, and is charged with tropical heat from six to nine degrees higher than the surrounding ocean, and which passing the whole length of the American coast, is lost in the Atlantic somewhere to the eastward of the Banks of Newfoundland. On this he has done nothing more than exhibit the experiments and opinions of Sir Charles Blagden and other writers.

As a counterpart to this vast and steady current of heated air sweeping all the countries adjacent to the Missisippi and the Ohio, on the west side of the great chains of mountains from the south-west, may be considered the strong, often violent, and generally moist and chilly winds which the north-east discharges along their Atlantic side. This may be considered as the eddy-current, which, having lost its warm and vivifying quality in some measure by exposure to the gelid surface of the arctic regions, has yielded its place to warmer streams, and is moving toward the equator, and after having replenished the rarefied southern latitudes, and after supplying itself with a new stock of caloric, will move back again in its former track, in a round of tolerably regular circulation. Hence can be understood how the atmospheric Gulf of Mexico, by sending out immeasurable quantities of air from the south-west, along the slopes of the Missisippi, shall stand in need of a corresponding supply from the north-east, along the coast of the Atlantic. For this reason our violent north-east storms frequently begin to leeward, or in the south-west, as was long ago observed by Lewis Evans and Benjamin Franklin; and of late the facts have been collected with remarkable care and accuracy, in relation to the great snow storms in February, 1802, and in January, 1805, and published in Med. Rep. Hex. i. vol. v. p. 465, and Hex. ii. vol. ii. p. 363.

Sometimes the south-west wind finds its passage over the mountain barrier, and causes heat, rain, and snow on the Atlantic side; and now and then the north-easters transgress their limits in like manner, and carry cold, frost, and snow, to the tramontane regions. Concerning this wind the author has arranged many excellent details between his 177th and 188th pages.

He observes (p. 176) that a *due north* wind seldom blows

in the United States, and is the most rare of all the atmospheric currents.

The east wind possesses the moisture, chilliness, and coldness of the north-east, of which it may be considered as the substitute; but it is by far less frequent. Though both of them are to be distinguished from the *trade winds* in the northern hemisphere, these latter not reaching further north than lat. 22 or 23 deg. but in certain extraordinary cases.

The fifth and last section of this chapter is the author's history of the *north-west wind*, which ranks after the south-west and north-east winds, as the third ruling wind of this country. Its cold, dry, and blustering qualities are very well described. Mr. V. derives it sometimes from a refrigerated layer of the atmosphere above our heads suddenly descending to the earth, and when it blows long and strong from the icy deserts and waters lying to the north-west of lake Superior.

As his theory of this wind, attempted in p. 244, is too brief and obscure to satisfy us, we shall present our readers something to remedy that defect, and we hope it will be allowed to contain the great principle upon which these boreal blasts depend.

The great expanding power acting upon the atmosphere is caloric. This is more powerful between the tropics than elsewhere. Hence, if the earth was an even and solid plain, it is probable that there would be a regular circulation in both hemispheres of heated and rarefied air in the upper parts of the atmosphere, from the equator toward the polar regions; and from these in return, an equal supply of refrigerated and condensed air is attracted over the earth's surface toward the zone, where the sun is vertical. If there was no collateral or counteracting force, the columns of cold and heavy air from the poles would move toward the equator in lines as straight as meridians. The direction in which such a chilled and ponderous air ought to move would be *south*.

But there is a collateral or counteracting force. This is the Atlantic ocean, which stretches from one end of the continent to the other. The mean temperature of this immense body of waters may be estimated at least as high as 60 deg. of Fahrenheit; while the mean temperature of the snow and ice lying far inland, may be estimated as very far below the freezing point of water, and often in high latitudes as low as cypher, or lower. Here then is a great disparity between

the heat of the Atlantic ocean and that of the great continent lying to the west of it, and stretching an immeasurable extent in that direction. A consequence of this must be, that the refrigerated and condensed air of the interior and mountainous country will be attracted over the earth's surface toward the warmer spaces occupied by the ocean. If there was no counteracting force, the columns of cold and heavy air from the mountains and gelid regions of the interior would move toward the ocean in lines parallel to the equator. The direction in which such a chilled and ponderous air ought to move would be *east.*

Here then the atmosphere of North-America is acted upon by two forces drawing in the direction of the two sides of a parallelogram; one of them pulling south toward the equator, and the other east toward the ocean. Now the consequence of these two forces exerting themselves as before mentioned, will be to draw the *moles movenda* neither south nor east, but in an intermediate direction between the two. This will be the diagonal of the parallelogram, and its course will be necessarily from north-west to south-east. But the air which is moved thus toward the south-east must come from the opposite point, and of course be a *north-wester.* And so much for a theory of this remarkable wind.

The talent which Mr. V. seems to possess in a higher degree than any other, is that for physical *Geography.* His delineation of the country, his picture of its mountains, and his account of the cataract of Niagara are agreeable proofs of his descriptive and narrative powers. But as we have seen before in the former part of this review, that he was ignorant of chemistry as it applied to mineralogy, so now he quite as plainly shows that he understands as little of the application of that science to explain the phenomena of meteorology. If a judgment might be formed from the view he has taken of the atmospheric ascent of water, its precipitation, and the formation of rain and other aqueous meteors, it would seem that he had never read the common treatises on spontaneous evaporation. He blunders at the very threshold, and confounds the *solution of water in air* during ordinary exhalation under "low temperatures," with the solution of the same *fluid in caloric* during exposure to a "boiling heat." And at this advanced age of chemistry, he seriously displays before his readers the little balloons (p. 215) of water, inflated by caloric, mounting aloft from the earth's surface. This exploded hypothesis is now renewed, and again imposed

upon the world; and so regardless is Mr. V. of giving the credit of it to him who first conceived it, that he never quotes *Desaguliers*, nor even mentions his name.

Equally uninformed, to all appearance, of the elegant memoir of *Hugh Hamilton* on the ascent of vapours, he seems to disregard entirely the consideration of atmospheric air as a menstruum, and water as a solvend upon which it acts. Apparently he knows nothing of the application of this chemical union of air and water by *Hutton*, to explain the whole theory of rain. Nor does he seem to reflect, that the water-balloons which he fancies will explain the phenomena of thunder-storms and water-spouts, had been rejected thirty years ago by the sagacious *Black*. But passing by all these authorities, Mr. V. considers that the condensation of these balloons of water, inflated by caloric, makes a vacuum in the part of the atmosphere wherever the vapour (as he calls it) is thus reduced to water (p. 217.) And in order to estimate the size or extent of the vacuum produced, he observes, that steam formed from boiling water occupies eighteen hundred times its former volume, and at the smallest expansion fills more than a thousand times its former space; and that, of course, a cloud of one thousand cubic fathoms may suddenly be contracted to a single *one*, or, to calculate within bounds, to *ten*. Hence the shock of the columns of air rushing into the void will produce thunder; and as its velocity in this effort to restore the equilibrium is as great as that of a cannon-ball (1380 feet in a second of time), he is no longer astonished at the destruction done to trees, ships, and houses, by gales, squalls, hurricanes, tornadoes, and other gusts of wind, which are only the currents of atmosphere rushing to fill up the vacuum caused by the condensation of the balloons of vapour into water. Now, notwithstanding there is no such steam engine and condenser in the Gulf of Mexico, and all the latter experiments and authorities contradict the hypothesis, yet our author lays this before his readers as modern philosophy.

But although thy patience, gentle reader, may be already wearied with the chemical reasonings of our traveller, we must intreat thee to hold out a little longer, until we translate for thee, his receipt for a thunder-shower (p. 214), which is almost a match for Dr. Swift's recipe for an Epic Poem: "It is known that there are no clouds without moist surfaces; that clouds are the product of the evaporation of waters, and of the volatile principles which they contain; that

this evaporation is copious in proportion to the heat, dryness, and renewal of the air; and that, consequently, cloudy vapours are a combination of molecules of water, with molecules of *caloric*. This is the *igneous* or *electrical* fluid; for, in my opinion, these words signify but the same principle, either pure, or under some modification. This principle, from its nature, light, and centrifugal, elevates water, which is essentially heavy, and forms of it, if I may venture to say so, little balloons, capable of floating and (voguer) of being wafted about in the air, and which are, at the same time, more or less electrical. Clouds may thus be a sort of neutral volatile salts, compounded of *caloric*, *air*, and *water*, whose elements are ready to become sensible again at the moment of their reduction or detonation; to wit, the water by the rain which falls, the caloric by the lightning which flashes and escapes, and the air in some manner less obvious to the sight. All these clouds are not attended with storms nor *thunder*. To produce these effects, it seems that they stand in need of a larger quantity of caloric, and that they are susceptible of being charged with different doses of it. It further appears, that at sea the abundance of watery fluid, and the temperature always more moderate than on land (a egalitè d'atmosphere), do not allow them to receive so high a charge of caloric, nor to become so *stormy* and *detonating*. And, in fact, mariners remark that storms are fewer on the high ocean, that they are less violent, and that they find them more frequent and violent as they approach land: consequently the intensity of the heat, or the abundance of caloric caused by the earth's reverberation, is a determining cause, a constituent principle of a storm. There must, however, be added a crowd of other materials abounding on the earth, and rarely or not at all existing on the water; such as volatilized mineral substances, brimstone, and the different gases which are disengaged in very considerable quantities from animal and vegetable bodies while they putrefy or undergo simple maceration. This circumstance occurs particularly in swampy soils, as in the Delta of the Missisippi, and all the drowned and sunken coast from the Bay of Mobile to the Bay of St. Bernard," &c. &c. On this passage we only remark, that a writer who gravely asserts the absolute identity of caloric and electricity, who declares that clouds are neutral salts, and these volatile too, and that heat is the principle of levity (which it must be, if it, from its very constitution, is lightly

centrifugal), possesses a rare quality of substituting conjectures in the place of facts.

The author's notion of clouds (p. 217) is so crude and singular, that we cannot refrain from noticing it. All the facts with which we are acquainted, evince that evaporated water, whether it is raised by spontaneous solution in low temperatures, or by the forced exhalation of a boiling heat, is chemically combined in such a manner with air or with caloric as to be perfectly transparent and invisible; and whensoever the water becomes evident to the eye, it is at once a sign of its separation or precipitation from the air or caloric to which it had been previously united. Cloudiness, therefore, is a proof that water, instead of remaining chemically combined with either of its menstruums, *has already* quitted its connection, and returned to its former state. Water, existing in the form of clouds, *having undergone* the condensing operation, is thereby rendered inelastic, and incapable of further condensation. Mr. V. however, gives a different account of the matter. He says, that when clouds, unequally charged with the *electric* or *igneous* fluid, approach and touch each other, there is a tendency toward an equilibrium; that this extremely subtile and attenuated agent quits its connection with the water to which it had been united, and abandons it to its natural gravity, to form drops and turn to rain. And in this conversion of clouds to rain there is formed a prodigious vacuum, which attracts the surrounding air, in some cases from such distances, and with force so great, as to cause not merely breezes and gentle currents, but squalls, gales, and hurricanes. How a cloud, which is merely water already condensed, and which is composed of small rain (as fogs and moisture) can be, by the operation of electricity, or any other agent, again turned to rain, and in the act of conversion produce a vast void, are matters utterly beyond our comprehension. In discussing this part of his work, the author is indeed very much involved in *clouds*, and we should not err if we wrote in *darkness* too.

The author, in his tenth chapter, compares the climate of the United States with that of Europe, in respect to winds, rain, evaporation, and electricity. He considers the configuration of our country, as determining the warm winds of the tropics, and the cold ones of the pole, in such a manner, as to render the climate more variable and unsteady. With some exceptions, the annual quantity of rain which falls is

greater, and the exhalation of this water from the earth's surface is also much more rapid; insomuch, that notwithstanding the quantity of rain which descends, there are more fair days, and more clear sunshine in the course of the year, than in Europe. The atmosphere is also much more highly charged with electric matter. This is manifest not only from the greater ease of exciting it by art, but from long, broad, and vivid flashes of lightning during showers, and from the frequent destruction of life thereby in men, domestic animals, and trees. He might have added the frequent burning of barns and other buildings by lightning.

In his eleventh chapter, Mr. V. declares, that though he does not deny the agency of the moon in causing the tides, he still finds it impossible to ascribe to a satellite of our planet, any immediate or sensible operation upon the general system of the winds. But he describes at some length the effects wrought in our atmosphere by the sun. After examining the facts which relate to the effects produced in the United States by clearing and cultivation, he concludes, from very extensive inquiries which he has made, that since the colonization of North-America, "*the summers have lengthened, the autumns are further advanced in the season, and the harvests are later; the winters are shorter, the snows neither so deep nor durable, but the colds not the least abated in their violence.*" On the whole, he doubts whether the climate has derived any real advantages from the labour and culture bestowed upon the face of the earth, and quotes a learned Professor, who rather leans to that opinion, as judged of by its effect upon the health of man, and by the increase of bilious diseases.

Our traveller proceeds, in the last place, to consider the prevailing distempers of the country which he describes. Those which peculiarly afflict the inhabitants, are, in his opinion, four in number; to wit, 1. *Catarrhs*, or COLDS, as the speakers of the English language call them; with the *Consumptions of the lungs*, in which they frequently terminate. The coughing, wheezing, asthmatic, and other pectoral disorders, are, indeed, so frequent and violent, that in legislative bodies, the voice of a member in debate is sometimes nearly drowned in the (not disrespectful) hemming and hawking of his hearers; and in churches, the reading of the service, and the preaching of the sermon, are greatly disturbed by similar interruptions. As far as the bills of mortality kept at New-York and Portsmouth (N. H.) go, they teach

us that almost *one-fifth* of the people at those two places die of consumptions; and it is to be feared, that the maritime parts of all the country between the Hudson and the St. Croix, lose two in ten of their inhabitants by this terrible disease. What shall arrest this unrelenting destroyer? 2. *Defluxions on the gums, and an early decay of the teeth.* From the inflammatory condition of the membrane lining the nostrils in catarrhs, the malady often spreads to the eyes, the throat, the trachea, the bronchia, and the eustachian tubes. The gums, the alveolar processes, and the vascular parts of the teeth themselves, apparently suffer so much injury from the *inflammation kindled up by the cold*, as to become thereby incapable of lasting many years. Tooth-ach, pains in the jaws, and rottenness, are the ordinary forerunners of extraction, or of their gradual crumbling and decay within the mouth. If any mode of dress, diet, or exercise could prevent catarrhs, the teeth might be saved. 3. *Autumnal intermittents, which prevail to an almost incredible degree in the neighbourhood of streams, ponds, and swamps.* These ailments, which rage far and wide, though not evils of the worst form, are, nevertheless, serious afflictions. It is to be hoped that they will decrease in proportion as the country shall be cleared, drained, and cultivated. 4. *The yellow fever.* Mr. V. concludes very judiciously that it is indigenous in the American States, and by no means brought by contagion from foreign parts. He has attempted a description of this endemic distemper, and a statement of the dispute *concerning contagion and importation.* The medical education which he received in his earlier days, enabled him to consider this controversy after the manner of a professional man. And the whole weight of his testimony is employed to inculcate the opinion that it is neither contagious in its nature, nor imported from foreign parts. Mentioning the intemperate use of ardent spirits as predisposing to this disease, he writes, what, alas! savours too much of a truism, that the people of the United States get drunk as bad as the Indians.

But Mr. V. himself indulges in inconsistency, which we ought to notice. "Although," says he, "there are facts enough to prove it is not universally contagious, yet if moist and septic exhalations from the earth can excite the disease, surely the effluvia from a diseased body may act in the same manner." We beg our readers here to recollect the difference between *contagious* matter and *septic* matter. The for-

mer is elaborated by the vascular action of a living body. The latter is produced by the putrefactive process in dead bodies. Contagion is a product of life; pestilential poison the result of chemical action after death. See now how these distinctions apply to the case before us. None of the perspiratory, urinary, or fecal discharges of the body are known to be morbid poisons or contagions. None of them possess, after separation from the body, any vital quality. The only changes to which they are prone, are those to which other *inanimate* substances are liable; and these are fermentation and putrefaction. If then the discharges from the belly, the bladder, and skin of a sick person, or of an healthy one, be confined and accumulated in a close chamber, pestilential poison might be engendered from them; yet this would not be contagion capable of propagating its kind, but merely septic matter, of qualities enabling it to produce some form of febrile distemper in the wide spaces between intermittent and yellow fevers, or between typhus and plague. The gaseous fluids evolved from animal excretions, and even from the dead body itself, which, when alive, furnished those excretions, has nothing *specifically* noxious in it, like contagion. The mischief it causes proceeds no further than to the living subject exposed to it. There it stops, and proceeds no further. To say that the disease induced by exposure to septic acid gas is contagious, is no more possible nor worthy of credit, than to affirm that the disease caused by submersion in carbonic acid gas, or in water, is contagious. It is true, indeed, that the body of an animal drowned in fixed air, or in water, may be withdrawn, and be exposed to putrefy in the common atmosphere. During the process of corruption, pestilential fluids may be formed, and these exhaling into the surrounding air, may kindle up yellow fevers, or other febrile disorders, in healthy animals exposed to them. What then? Does any man of sense pretend that these septic effluvia were derived from the fluids in which the animal was immersed or drowned, and not locally engendered in the putrefying carcase itself?

On this interesting subject the *contagious and importing party* are undoubtedly influenced by patriotic feelings. Such is their love of their country, that they cannot endure the reflection that so foul a disease as yellow fever should originate within it. Such a destructive malady, they contend, must therefore be derived from abroad, and introduced from some region less favoured by nature than ours. Would to God

these opinions were just! We see them contradicted by numberless facts every year of our lives. We behold yellow fever arise in the West-Indies, in the ports of the United States, and the vessels which sail between them. We observe in all these cases the local origin of the distemper on ship-board, or in the southern and northern ports respectively, without being derived from one to the other. We can trace the malady to local distemperature of atmosphere, and satisfy ourselves that it is wholly non-contagious. And if our people of the middle States would be wise, they would admit the truth, which would be consoling to themselves, and have a tendency to quiet the civilized world; *that the people of the United States of America are, like the inhabitants of the West-Indies, the East-Indies, and the south of Europe, sometimes afflicted with malignant fevers; but that the governments of the earth need be under no alarm nor concern; for as these fevers are destitute of contagion, they are neither imported from Cuba, nor any place in the Gulf of Mexico, on the one part, nor exported to Cadiz, or any other port of Europe, on the other.* It is a domestic affair, *afflicting to ourselves indeed, but in no wise terrifying to our neighbours.* The policy pursued by our cities on this subject for the last eight or ten years, has already agitated all the governments of Europe, and is as injurious to our national character for good sense and discernment, as it is to our commerce.

But it is time we should conclude our remarks. Yet we hesitate to quit the subject without mentioning the supplementary papers which accompany the volumes. A copious appendix contains several important illustrations of the text. The chief of these are, 1. Mr. Burgoing's paper on the winds of Norway and Sweden. 2. An abstract of the history of Florida, which B. Romans published at New-York in 1776. 3. A notice of Belknap's History of New-Hampspire, and Williams' History of Vermont. 4. Observations on Galliopolis, and the French settlement on the Scioto. 5. Remarks upon the aborigines or Indians of North-America. 6. A vocabulary of some words in the Miami tongue. In addition to all which we add, that the Philadelphia translation contains many critical and explanatory notes by the ingenious Mr. Brown, who made that version from the French original into the English tongue.

ART. IV. *An Account of a Voyage to establish a Colony at Port-Philip, in Bass's Strait, on the South Coast of New-South-Wales, in his Majesty's Ship Calcutta, in the Years* 1802-3-4. *By* J. H. Tuckey, *Esq. first Lieutenant of the Ship.* 8vo. pp. 239. *London.* Longman & Co. 1805.

IN noticing this little volume, it is not our design to dwell upon the policy of Britain in substituting exile for imprisonment and death, and on sending persons convicted of certain crimes, to found colonies in the distant but inviting regions of New-Holland. The germ of population which is there planted may grow to an empire, in which the language, laws, and manners of the English seem likely to be extensively diffused, and long preserved. In that vast country, more resembling a continent than an island, in Bengal and its dependencies, and more especially in the rapidly increasing American States and their territories, we predict that the tongue and the institutions derived from their common Saxon forefathers, will continue to be respected by generations without end.

Nor is it our intention to enter into a minute examination of this voyage for transporting new supplies of outcasts from the mother country, to recruit the settlements at Port Jackson and Port Philip. But we think it proper to observe, that Bass's Strait separates New-Holland from Van Diemen's Land. It is in about 39 deg. S. latitude. It was discovered by Surgeon Bass, of the navy, in 1799, and surveyed by him and Mr. Hinders. They found it to be from one hundred to one hundred and thirty miles wide, and to open a clear passage from the Indian ocean to the great Pacific. Port-Philip, situated on the north side of this strait, was afterwards discovered by Lieutenant Murray. And it was the wish of the British government, from commercial and political motives, to establish a colony there; as such a possession and settlement would keep rival nations away, and, at the same time, afford security to its subjects employed in killing seals and sea-elephants on the neighbouring islands. The attempt, however, proved abortive; for the barrenness of the soil, the scarcity of fresh water, the uncertain supplies of fish, the scarcity of good timber, the absence of coal, and some other inconveniences, determined the conductors of this enterprise to remove the colony across the strait to Van Diemen's Land, where it was fixed at Hobart,

near the river Derwent, on its southern side, at which a small party from Port Jackson had been established before.

Having stated thus much of the objects and contents of the book, we now observe that our chief reason for taking it in hand was to entertain our readers with Mr. Tuckey's remarks on Brazil, made while the ship, which put into Rio Janeiro to refit, was undergoing repairs. P. 41 and 72.

"We reached that port the last day of June, and immediately commenced the necessary refittal of the ship, to enable her to encounter the long succession of stormy weather which the season of the year taught us to expect in the remainder of our passage to New-Holland. The small island of Enchardos, about two miles from the town, was hired with permission of the Viceroy, for the purpose of repairing our water casks, and landing the women to wash; a dilapidated monastery affording them and the marine guard a comfortable mansion.

"The entrance of the harbour of Rio de Janeiro is narrow for about a quarter of a mile; it thence widens into a secure basin, which, at the town, is five miles in breadth, and extends inland beyond the reach of the eye: several fruitful islets are scattered on each side, which, covered with loaded orange-trees, almost realize the fiction of the gardens of the Hesperides.

"The shores which surround the harbour are vastly mountainous, forming abrupt and craggy precipices of the most wild and extraordinary shapes. Nature seems to have sported in the formation of this her last work, and to have combined all the fanciful forms, which she scattered more sparingly over the old continent. The entrance of the harbour is pointed out by a towering cliff on the south side, rising perpendicularly from the sea; while, at the head of the port, the mountains rise into higher elevations, and present forms more strikingly singular:

> *Rocks rich with gems, and mountains big with mines,*
> Whence many a bursting stream auriferous plays,

are here seen, now faintly peeping from behind the intervening clouds, and now presenting their dark blue summits above the flaky vapours that roll along their sides.

"These mountains consist entirely of granite, forming an adamantine barrier to the waters of the ocean. They are clothed in every part where the least soil can remain, with trees and shrubs of various kinds; and even to the naked rock vegetables are seen to adhere, which appear to

derive their nourishment from the moisture of the air alone. Here are many picturesque vallies, narrow, but winding along the base of the mountains, from the shores of the harbour to some distance inland. These glens are supereminently fruitful, from the combined causes of superior heat and moisture; the first proceeding from the reflected heat of the sun, confined in a narrow space, and the latter produced by the condensation of the vapours, attracted by that heat, or driven by the winds against the mountains' sides. The numerous little caves at the entrance of these glens, are bordered with beaches of the finest sand, where fishermen have erected their dwellings, and which, viewing them from without, have all the apparent neatness of our best English villages; but too soon we find, on entering them, that this is the mere effect of white-wash, and that within they are the habitations of sloth and nastiness. The town of St. Sebastian is built entirely of granite, which appears to be the only stone found here, except a species of black and white marble. From the Bay the appearance of the town is not inelegant, but the deception vanishes on a nearer approach. The streets, though straight and regular, are narrow and dirty, the projecting balconies sometimes nearly meeting each other; the houses are commonly two stories high, independent of the ground floors, which are occupied as shops or cellars; they are dirty, hot, and inconvenient; the staircases are perpendicular, and without any light; and in the arrangement of the rooms, no regard is paid either to a free circulation of air or to the beauty of prospect. The furniture of the houses, though costly, digusts the eye used to elegant plainness, by its clumsiness and tawdry decorations; while the spider weaves her web, and pursues her sanguinary trade in uninterrupted security upon the walls and ceiling. In the houses of the rich, the windows are glazed, which only serves to increase the reflected power of the sun, and render them intolerably hot; but the generality of houses are furnished with shutters of close lattice-work, behind which the women assemble in the evening; and while their own persons are concealed, enjoy the passing breeze, which is not, however, always very aromatic. In the English settlements within the tropics, art is exhausted to correct or mitigate the ardour of the climate, and to render a burning atmosphere not only supportable, but pleasant to a northern constitution. In the Brazils the defects of climate

are increased by the slothful and dirty customs of the inhabitants. The cause of this difference is to be ascribed to the climates of the mother countries; the climate of Portugal approaching to that of Brazil, the Europeans who emigrate hither, feel little inconvenience from the change; in our tropical settlements, the climate of their old differing so much from that of their new residence, the emigrants leave no means unemployed to mitigate the fervour of the sun, whose ardent blaze is found to derange the nervous system, enervate the body, and render the mind a prey to listlessness and inanity."

"The city of St. Sebastian, from being surrounded by hills, which prevent the free circulation of air, is more unhealthy than the other settlements on the coast; and the dirty customs of the inhabitants tend to increase the defects of situation. The diseases most prevalent are fevers, dysentery, and hydrocele. Fevers, if not entirely generated, are undoubtedly multiplied by the noxious effluvia arising from the unremoved filth in the streets; for here the windows give a nightly exit to all the vile accumulation of the day.* Dysenteries may probably proceed from their method of living, or their common kinds of food, of which fish, fruit, and sweetmeats form the principal articles. The chief animal food of the lower-class is salted pork not half cured, or jerked beef, both brought from Rio Grande; and their beverage is a deleterious and ardent spirit, which, from its cheapness, comes within the reach of their scanty finances. The causes of the hydrocele, which often renders those afflicted with it the most pitiable objects, may, perhaps, with equal reason, be traced to themselves; for, by the continual use of tepid baths, they increase the naturally great relaxation which pervades the system in a warm climate. In our English settlements, where cold bathing is daily practised, such a disease is almost unknown.† During the winter the thermometer seldom rises above 74 deg. and sometimes falls to 65 deg. At this season heavy dews descend during

* "For an exact description of St. Sebastian's in this respect, we beg leave to refer our readers to Mrs. Winifred Jenkins, and shall only remark, that whosoever walks under the windows at ten o'clock at night, will probably have occasion to cry, 'Lord have mercy upon me!'

† "I know of but two other parts of the world where this disease is greatly prevalent: at Cochin, on the coast of Malabar, and in the island of Barbadoes."

the night, and the mornings are enveloped in thick fogs, but soon

> ———The potent sun
> Melts into limpid air the high rais'd clouds,
> And morning fogs that hover'd round the hills,
> In party colour'd bands,

leaving the atmosphere pure and serene. The land and sea breezes are tolerably regular: the former commences towards morning, and is commonly very light. The sea breeze may be seen curling the surface of the ocean at noon, but it seldom reaches the town before two o'clock. It is generally moderate, cool, and refreshing.

"The Creoles, at this season, seem to feel all the effects of rigorous cold: while we were melting in the lightest clothing, they muffled themselves up in their cloaks, and sat shivering, with their doors and windows closed. The rainy season commences in August; and for six weeks or two months, a continual torrent pours down, with a close and suffocating atmosphere. To the rains succeed the dry and parching months of November and December, when the Creoles are again re-animated; and awakened by the ardent blaze of the sun, from the lethargic torpidity of winter, renew their occupations or amusements."

We also select some other of the author's remarks, which we trust will need no excuse. P. 77.

"The chief vegetable productions of the district of Rio de Janeiro, are sugar, coffee, cotton, cocoa, tobacco, and indigo; of these, sugar is alone indigenous, and was found growing wild by the first colonists. The tobacco raised in the Brazils is consumed there in segars and snuff; and the cultivation of indigo has been much neglected since the East-Indian indigo has rivalled it in the European markets. The soil is every where so rich, that it requires all the labour of the farmer to check the too luxuriant vegetation, and keep the ground free from brush-wood and shrubs; a few months' neglect covers the soil with a tangled underwood, bound together and rendred impenetrable by creeping vines. Twelve different kinds of oranges are cultivated here, and all other tropical fruits grow almost spontaneously; the soil has also been found friendly to the spices of the East, and pepper is already cultivated with some success: in short,

> Whatever blooms in torrid tracks appear,
> Whose bright succession decks the varied year,
> These here disporting own the kindred soil,
> Nor ask luxuriance from the planter's toil.

" The horses of Brazil are small, and incapable of much labour; in the interior they run wild in vast droves, and are of so little value, that they are merely caught to perform a journey, and when tired, or the journey is over, are again turned loose. The mules, which graze in flocks about the town, are the chief beasts of burthen, and are particularly adapted to the precipices of the country. Oxen are brought from Rio Grande, where they are worth about eight shillings each, and where they are slaughtered merely for their hides and tallow; on their arrival at Rio de Janeiro, though wretchedly impoverished by the journey, they are sold for fifty shillings to four pounds a head. The farms are fenced by lime-bushes and orange-trees, intermixed with various flowering shrubs, equally beautiful and aromatic. At night the trees appear illuminated by myriads of fire-flies, which play among the branches, for here

> ———On every hedge
> The glow-worm lights his gem, and through the dark
> A moving radiance twinkles.

" The district of mines commences about sixty miles from Rio; their produce is conveyed thither on mules, escorted by detachments of cavalry, of which there is a regiment stationed at Minas, the capital, which is said to be large and populous. This province extends to the borders of the Spanish settlements in Paraguay. The journey to Matto Grosso, the farthest Portuguese station, is by Rio Grande, and is said to take up six months in contending against the stream, but the return is made in about three months; from hence comes the sarsaparilla and balsam copaiba. The most minute precautions are taken to prevent the concealment of diamonds, by persons of every description coming from the mines; they are not only stripped naked, and minutely searched, but even their horses and mules are *purged:* this strict scrutiny sets ingenuity to work to evade it, and the attempts are often successful. A Friar coming from the mines has been known to conceal three superb diamonds in the waxen figure of the Virgin, which he carried in his pocket; the superstition of his examiners held the divine image sacred, and kissing it with greater devotion than they would probably have felt for the loveliest female of mere flesh and blood, returned it to the holy Father unexamined.

" The King's tenth of the gold is taken from the ore at the smelting-house, where it is cast into ingots, which are stamped, and then become a legal tender in payments. If

the owner wishes to have it coined, it pays two and a half *per cent.* at the mint. The colonial gold currency is in pieces of four millres, or twenty-five shillings sterling; these are greatly alloyed, to prevent their exportation from the colony. Most of the gold sent to Portugal is coined into half joes (£2); and the exportation of uncoined gold is forbidden, upon pain of transportation for life to the coast of Guinea."

"The harbour of Rio Janeiro is well defended by forts and batteries on every commanding position, which are garrisoned by about 4,000 regular troops, who make a very respectable appearance, and seem to be extremely well disciplined. The whites of every description, amounting to 10,000, are enrolled in a militia, and exercised once a month. From this motley group, however, little service could be expected in the hour of attack, and we might justly exclaim,

> 'Twas not the spawn of such as these
> *That dar'd the elements on pathless seas,*
> And made proud Asian monarchs feel
> How weak their gold was against Europe's steel;
> But soldiers of another mould,
> Rough, hardy, season'd, manly, bold.

"With respect to the political relations of the colony and the mother country, we may safely assert, that the bonds of dependence have been drawn so tight, that they are almost ready to break. The restraints on trade, the income tax of ten *per cent.* levied with the greatest rigour (a tax unknown in the English colonies), and the venality of those in office, are glaring evils, which absolute mental blindness could alone prevent the Brazilians from seeing. The spirit of discontent, which had been long silently fermenting, openly showed itself a few months ago, upon an attempt to introduce a stamp act into the colony. This measure met with universal resistance from the colonists, who, to avoid the penalties arising from non-compliance, transacted all their money concerns *viva voce*, and upon honour.* Should the irritated colonists be driven to extremities, the mother country will probably find too late, that though a disease at its commencement may be removed by gentle remedies, it will, by neglect, soon grow too powerful for the most desperate. The spirit of revolution which, like the element of fire, seems to pervade the habitable globe at the present moment, is rapidly gaining strength in these trans-atlantic regions. The philo-

* "This act has since been carried into effect.

sophy of Helvetius, Voltaire, Rousseau, and Volney, has here its admirers and supporters, who only wait the favourable moment to kindle the latent sparks into flame. These principles are chiefly circulated and extended by a masonic society; which neither the despotic power of the civil government, nor the denunciations of the church, have been able to suppress or control. In 1803 this society consisted only of twenty-five brethren; in 1804 their numbers have increased to one hundred. Several officers of the inquisition have been sent from Portugal to suppress it, but without effect; and the presence of these spiritual jackalls creates but little uneasiness, as they possess no temporal authority, and can only send the culprits to Europe upon proof of their guilt. The French republic, which seems to neglect no means of revolutionizing every part of the globe, and to which force and intrigue are indifferent in this pursuit, have not forgotten the Brazils, where their emissaries are sufficiently active in the cause of anarchy and confusion. The mother country, aware of the slippery tenure by which the colony is held, with all the fears of a weak despot, prohibits the erection of a printing-press.

"Should the Brazils revolt from their allegiance to the parent state, which, in the course of national events, is by no means improbable, and to which present appearances would authorize the fixing no very distant period, the immense regions of Spanish America will doubtless pursue the same steps. This region of the globe appears, from its geographical position, to be peculiarly adapted to the growth of powerful states, while its natural divisions and external aspect are eminently favourable to the preservation of liberty; for though, in its extent, it occupies the whole of the torrid zone, from its great elevation it enjoys a more temperate climate than the southern provinces of Europe, and is, consequently, more congenial to freedom. Had South-America been colonized by a northern people, who would have cherished the freedom they conveyed thither, it would at this day have presented a very different appearance."

There would be no need of enlarging this article, was it not deemed by us proper to extract what Mr. T. writes on the island of Tristan d'Acunha, which may be considered as belonging to America, and therefore falling within our limits, both as geographers and reviewers. P. 115.

"On quitting the American coast under the tropic of Capricorn, the seaman takes leave of summer seas and gentle

breezes for the rest of his voyage through the southern hemisphere: his care then consists in preparing his vessel to encounter the turbulent elements he is to meet with. But the storm which terrifies the landman into repentance and vows of amendment, is welcomed by the experienced sailor, as expediting his passage; for he never considers how strong the wind is, while it continues fair, and his bark is able to run before it; or, if it is foul, he consoles himself, from day to day, with the certainty, that the longer it has continued so, the nearer it is to a change. At this season the prevailing winds south of the parallel of 36 deg. S. are westerly, which often blow with unabated violence for months together. The southern polar ices, which in summer are often found floating in large detached islands, as far as the latitude of 37 deg. are in the winter bound together, or chained to the Antarctic rocks, and thus they withstand the force of the winds and currents; their neighbourhood is, however, evinced by the degree of cold, which gradually increases from the tropic, till in the latitude of 40 deg. where the thermometer falls to 50 deg. with showers of sleet and hail.

"Quitting Rio Janeiro the 19th of July, with the wind at E. N. E. we shaped our course to the southward, in order to get into the region of westerly winds, which came on gradually till they fixed in strong N. W. gales. It was now found impossible to keep company with the Ocean without running under bare poles, which strained the ship violently, and we therefore parted company near the islands of Tristan d'Acunha; the largest of which we made on the 2d of August. The preceding evening it had blown a heavy gale, with a mountainous sea; but, as we approached the island, the wind moderated to a fine breeze, the billows subsided, and the clouds clearing away, showed the full-moon suspended in the clearest ether. By her friendly light, at about four o'clock we saw the land, at six leagues distance. As the dawn arose, the horizon becoming hazy, concealed it from our sight; but at sun-rise the vapours again dispersing, left us a clear view of it till noon, when it was fourteen leagues distant.

"These islands were discovered by the Portuguese in their first voyages towards the Cape of Good-Hope: they are three in number, the largest being that which we passed at the distance of two miles; it is almost bare of vegetation, but in one small spot on the north side, from whence a stream of water was observed precipitating itself into the sea: ex-

cept in this place the north side of the island rises abruptly to a peak, the summit of which was at this time veiled by the clouds. These islands abound in sea-elephants, whose oil is more valuable than that of any other amphibious animal; and their tongues, when salted, afford no despicable resource in a scarcity of provisions.

"From Tristan d'Acunha, a short run of eleven days brought us off the Cape of Good-Hope."

After having proceeded thus far, we should deem ourselves inexcusable if we shut this publication without adverting to what he has offered on the means of preserving health on sea voyages. Dreadful mortality has in several instances taken place among the convicts going to New-South-Wales. This proceeded from nastiness engendered on board. This filth was of two denominations, that adhering to the persons, clothes, and bedding of the passengers, and that which befouled the whole interior of the ship. This class of passengers, like most others who are left to themselves, equally indolent, careless, and ignorant of a vessel, are frequently so negligent, that severity is sometimes necessary to keep them from being devoured with vermin, and besmeared with their excrementitious discharges. In passing through the hotter latitudes, these foul proceeds of the human body are not unfrequently converted, by chemical action, into febrile and pestilential matter; and this, volatilized by heat, and floating through the ship, as well as sticking to the bodies of the passengers and their coverings, often excites the most fatal kind of distempers.

This inbred and local cause of mischief may be with certainty prevented; not, however, says Mr. T. by fumigations with *devils composed* of wetted gun-powder, nor by the acid vapours which a few philosophers have, ingeniously to themselves and to science, recommended of late, but by the old and infallible methods of CLEANLINESS and VENTILATION, which every chamber-maid and washer-woman understands, and which it requires no small acquaintance with fashionable chemistry to pervert and misconceive. Water alone, or water alkalized with pot-ash and soda, so as to form ley and suds, will accomplish the former; while fires of coal, and bellows air-pumps upon the plans of Wynkoop and Robotham, expelling the contaminated air of the ship, and introducing the pure atmosphere of the ocean in its place, will, with the aid of quick-lime, accomplish the second part of the work of purification. For the entire ex-

planation of this, see Med. Rep. Hex. i. vol. v. p. 191 and seq. He advises that all the woollen clothing, bedding, &c. should be washed out, on entering a hot latitude, and afterwards dipped in lime-water and dried without wringing. But for a minute view of this process, we refer to Med. Rep. Hex. i. vol. iii. p. 170; on a perusal of which the reader will be satisfied, that though solutions of lime are good, those of pot-ash and soda are much more neat and efficacious.

Bathing the bodies of the passengers, scrubbing the lower decks (a very important matter) *with blocks of wood and dry sand*, hanging up the hammocks, airing the beds, avoiding receptacles and bye-places for throwing bones and gathering other filth, fobidding the hanging up of *wet clothes* below decks, and due attention to the quantity and quality of food are separately mentioned by this intelligent officer; and carelessness on any of these points will lead to the mischiefs which a due observance of them will prevent. With so many causes of uncleanness and distempers on ship-board, is it not one of the most remarkable of human mistakes, that among legislators and professors, as well as the populace, the whole internal sources of disease in a vessel should be overlooked, and the blame of fevers bred within her be thrown upon a foreign country, and more particularly upon the port whence she last sailed? We believe this error will shortly be corrected: in the meantime we conclude, in the words of our author, (p. 239) "that wholesome diet, sufficient exercise, and proper attention to cleanliness, are the most effectual preventives of disease on long voyages," and, we add, every where else.

ART. V. *The American Gardener; containing ample Directions for working a Kitchen-Garden every Month in the Year; and copious Instructions for the Cultivation of Flower-Gardens, Vineyards, Nurseries, Hop-Yards, Green-Houses, and Hot-Houses. By* John Gardiner *and* David Hepburn, *late Gardeners to Gov. Mercer and Gen. Mason.* 12*mo. pp.* 204. *Washington City.* Smith. 1804.

IT is stated that this small volume contains the experimental facts ascertained during forty years; of which one half were employed on this, and the other on the other side of

the Atlantic. From such a source it may be expected that the art of gardening may derive great advantages. For hitherto our gentlemen who have undertaken to improve their estates by horticulture, have been too frequently obliged to have recourse to European books, and to employ European gardeners, or to experience the delays, disappointments, and losses which never fail to attend an original course of experiments. There is respectable testimony, indeed there seems to be ample evidence of Mr. Hepburn's skill in the management of a garden. As far as we can judge, he must have become an experienced artist before he left the eastern hemisphere; and he has assiduously improved himself by following the occupation since that time.

A practical book from a man who brings to Maryland the information on this sort of agricultural industry which is current in England, and who adapts the system of gardening in Britain to the climate, soil, and situation of the United States, may be considered as a valuable performance. Such a publication is very much wanted; and there can be little doubt, that, provided it be faithfully executed, it will be eagerly sought after as soon as it shall be known to the body of cultivators. The authors declare, that if they could have met with such a work as this on their arrival in America, they would have been several crops the richer; and they offer this result of their practice and trials to the public, for the direction of those who are desirous of gardening correctly and profitably.

This branch of husbandry, we are glad to observe, is rapidly improving. The demand for the delicate and wholesome products of the kitchen-garden has increased very much in our large cities. But it is not confined to those thickly settled places. Throughout the country the taste for gardening has become very fashionable, and vegetable food is consumed in greater proportion, and with additional relish. Vegetables heretofore difficult to raise, are already domesticated or naturalized, and reared with exquisite skill. Even the summer cauliflower is produced of a very large size and tender quality in the neighbourhood of New-York, and from seeds which ripen on the island of Manhattan. In the department of the flower-garden and the tree-nursery Mr. Prince has been long celebrated. Williamson, Sheriff, Hasties, Throgmorton, and a multitude of others, have shown what skill and industry will do in the cultivation of useful and ornamental plants; while the elegant plantations

of *Stevens*, at Hoboken, near New-York, and of *Hamilton*, on the bank of the Schuylkill, near Philadelphia, present to those who visit them, the exotic productions of the most distant regions, growing in the same beds, and beside the same walks in which our indigenous vegetables are planted.

We indulge an expectation that the volume now before us will facilitate this spirit of improvement, and encourage proprietors to cultivate their grounds in such a way as to insure at the same time beauty, plenty, and emolument. To render the subject easy, the authors have divided the book into two great sections. The first treats of the management of the kitchen-garden, and occupies about one hundred pages. The directions are given by the month, beginning with the subjects which require attention in January, and so continuing through the winter, spring, summer, and autumn, quite to December. The precepts and instructions are delivered in short paragraphs. These are plain and practical.—The second section treats of fruits, flowers, and shrubs. It proceeds through the year by months, as in the former part. And the monitions and hints to gardeners are delivered in similar concise and sententious terms. These occupy almost an hundred pages more. The rest of the work is employed on the raising of hops, and on the construction and economy of hot-houses and green-houses.

We shall next give an extract or two from the work; and the first which we offer our readers is the art of forming hot-beds. P. 6.

" Take fresh horse-dung with plenty of long litter in it; shake the dung well, and place it on a piece of ground the size of the bed you want to make: the first layer or two should have more litter than the others—beat the dung well down with your fork as you proceed with the layers, until your bed is of the height you want it. Different vegetables require beds of different heights, but the mode of making them is the same. The bed being thus made, place a frame light over it, and in six or eight days the bed will be in a strong fermentation.

" *To temper a hot-bed*—When the frame has been on six or eight days, take it off: if the bed has settled unequally, make the surface level by laying on a little old dung: run a stick or fork-handle into the bed; let the stick stay there five minutes; on pulling it out, if it is more than a temperate heat, lay on the frame; tilt up the back lights, that the steam may escape, and close up the holes

you bored. When the bed comes to a temperate heat, it is ready for use. Hot-bed lights are generally four one-half feet long, and two one-half feet wide.—If you have not frames to cover hot-beds, make a shelter with arches of hoops covered with mats, or a shed of branches covered with straw. In severe weather the plants must be protected, and in fine weather exposed to the sun; always covered at night, and very well covered when the nights are frosty."

Directions being given on this fundamental point, the authors treat of the management of it, so as to bring forward cucumbers, to force asparagus, to raise radishes, lettuce, carrots, spinach, mushrooms, snap-beans, and various plants, during January and February, the coldest months of the year.

The following are the instructions of the authors as to the grafting of trees. P. 114.

"Early or the middle of March is the best time for grafting: it is performed in different methods; the best are the following.

"*Cleft-grafting*—Cut off the head of your stock at the height you please, cleave it with a strong knife across the middle, so deep as to admit the graft; then cut about an inch and a half length of the top of the stock in a sloping manner, that the top may be reduced to half its diameter; observe the sloping cut must be across the cleft. Your graft or scion should be four or five inches long, and should have four to six eyes. Cut the lower end of it to the shape of a needle about two inches long, leaving double the quantity of wood on one side of the pith that you do on the other, so that one side will show double the bark that the other does. Open the cleft with a chisel inserted at the sloped side of the stock, so that the two rinds may meet exactly. Remove the chisel, tie the graft and stock firmly together with a soft bandage, and cover the bandage with grafting clay, which cover must be made of an oval form, extending an inch above the top of the stock, as much below the bottom of the graft, and thick enough effectually to exclude rain and sun. The graft must be frequently examined, and if any clay falls off, or is cracked, repair the covering. In June the clay and bandages may be taken off, as the grafts and stocks will in that time be united.

"*Whip-grafting* is generally performed upon small stocks with grafts of nearly the same diameter. Cut your stock at the height you wish it—cut it off where the rind is

smooth—pare off the rind and part of the wood on one side of the stock, about two inches in length, and sloping upwards—cut your graft sloping, to fit the stock exactly—then cut a slit or tongue in the graft, extending upwards half an inch—cut a slit in the stock downward to receive the tongue: having placed the graft upon the stock thus, the rinds meeting exactly, tie them together firmly with a soft bandage, and immediately cover the bandage with clay.

"*Crown-grafting* is performed upon stocks that will not cleave readily, and upon branches of trees (particularly apples and pears) whose fruit is to be changed to a better kind: cut off the top of the tree or branch level, and pare it smooth—cut your graft to have a small shoulder about two inches from the end, for resting upon the top of the stock, and from that shoulder slope the graft away on one side to a flat point at the end; pare away a little bark on each side of the circular part of the graft, with a wedge flat on one side and circular on the other; open a place between the bark and wood of the stock large enough to admit the graft, and thrust it in so that the shoulder will rest on the stock. In driving the wedge, keep the flat side to the wood, that the round side may make room for the round part of the graft.

"Thus several grafts may be placed on one branch or tree. When done, bind them well on, and cover the bandage with clay, so as to prevent water from lodging on the top of the stock or getting to the grafts. These grafts will be well united the ensuing summer. In the meantime it is necessary to secure them from being blown away, by fastening stakes firmly to the stocks, and tying to them the grafts. Crown-grafting will be done most easily the latter end of March or beginning of April, because the sap being rising, the bark will part from the wood the better. The clay covering must be examined occasionally, and repaired if necessary.

"*Observations on grafting.* Your grafts must be last year's shoots; they may be taken from the trees on which they grow, either when you are going to use them, or a few weeks before, provided you lay the lower ends of them in dry earth in a warm situation, and shelter them well from severe weather. Shoots for grafting next month should be cut this month, and laid up in this manner, because the buds will swell fast the latter end of this month, and soon after be too far advanced to take kindly with the stocks.

"Graft apples upon stocks raised from kernels of apples or crab-apples. The kernels may be sown in February or November, in beds about three feet wide. Sow them pretty thick, and cover them an inch or an inch and an half deep with earth. If not sown till February, you must keep the kernels in sand. The plants will appear in six weeks. Next fall or spring following the largest may be planted in nursery-beds. The second or third year they will be in order to graft on the dwarfs; the fourth or fifth year in order to graft on for standards.

"Graft pears on stocks raised from kernels of pears or quinces. Sow kernels of pears, and attend the plants in the manner just directed for apples. Graft cherries on stocks raised from cherry-stones, either of black or red cherries. Sow the stones in October or November, on beds about four feet wide, covering them about two inches with earth.

"The second year after sowing they will be fit to plant in nursery-beds, the fourth year fit to graft or bud for dwarfs and espaliers, and the sixth year fit to graft for standards. Graft plumbs on stocks raised from plumb-stones. Sow the stones in the fall (say October or November) in beds, covering them with about two inches of earth; transplant them into nursery-beds next fall or spring following. In two or three years they will be fit to graft upon. Stones of cherries and plumbs may be kept in sand over winter, and sown in February or March. Stocks of fruit trees may be raised from suckers and cuttings, but those from seed are generally stronger."

We should take pleasure in copying the directions for inoculating or budding trees, given in p. 140, for the month of June, though he directs this operation afterwards, in p. 148, to be done in July; but we hasten to mention the method of treating carnations and pinks; it is as follows:

"Shade these flowers, and continue to support the stalks by tying them to stakes; water them about three times a week. When the carnation flower-pods begin to burst, assist them by making two or three incisions in the skin of the pod with a sharp pen-knife, from the top half-way down. The flowers will open more regular and beautiful for this operation. Carnations and pinks may be now (June) propagated by layers thus: Take shoots of this year's growth that are five or six inches long—strip the leaves off nearly to the top—clear away the weeds about the mother-plant—loosen the earth, and make a bed of it high enough to receive the

shoots when bent down—secure them in their places with a hooped stick—and cover them with five or six inches more of earth. Before the shoots are bent down, a slit must be made in each, extending about half-way from the lowest joint toward the next joint, and two inches of the top of each shoot cut off. They will blow next summer. Carnations and pinks raised this year from seed may be pricked out this month into nursery-beds of good earth, well dug and raked even—place the plants about six inches asunder, and water them."

The directions for pruning apples, pears, plumbs, cherries, peaches, nectarines, and apricots, in October, appear to come from practical observers; as do the instructions for gathering winter apples and pears, and for transplanting espalier fruit-trees, currants, gooseberries, strawberries, raspberries, barberries, filberts, mulberries, figs, vines, and generally fruit-trees and flowering shrubs. In a country where extensive breweries are established, Messrs. G. and H.'s short chapter on the *cultivation of hops* (p. 183) cannot be read with indifference. In a land visited with such extreme cold as frequently accompanies our winters, the essay on *hot-houses* may be expected to invite many readers (p. 187). And for the same reason, in a climate where autumn frequently anticipates winter, and in which winter incroaches far upon spring, the concise section on *green-houses* deserves the perusal of the various rural improvers, from market-men and florists up to gentlemen of taste and fortune.

We shall close our remarks with observing, that this practical book is rather calculated for the seasons as they appear in the neighbourhood of the Chesapeake and of the Potomac, than for the northern and eastern States. But we suppose that with the allowance for time and climate, which can be easily made, the same directions will be applicable to every part of our country.

ART. VI. *A Collection of Facts, interspersed with Observations on the Nature, Causes, and Cure of the Yellow Fever; in a Series of Letters addressed to the Inhabitants of the United States. Part* i. *By* Thomas Ruston, *M. D. &c.* 8*vo. pp.* 65. *Philadelphia.* Graves. 1804.

ELEVEN compositions, in the form of letters, are contained in this pamphlet. They are dedicated to a lady, and under her sanction offered to the author's fellow citizens. Their general character may be judged of from an exhibition of a few of the opinions maintained by the writer: for example, he has no faith in the antiseptic qualities of alkalies (p. 6); he is a firm believer in the purifying operation of nitric acid vapour (p. 9); he asserts that the distemper which prevailed at Cadiz in 1800, was carried thither in a vessel from America (p. 26); and he is an adherent to the doctrine of contagion.

The letters are written with very little regard to method or matter. The information they contain about yellow fever is scanty, and even that which they do contain is not new or original. The remarks on the death of Pericles and the plague of Athens, are unworthy of a comparison with the learned and critical essays on the same subject, by the late Dr. E. H. Smith, in Med. Rep. Hexade i. p. 5, and vol. ii. p. 336, 3d edit. And his accounts of fever in Andalusia, among the Spaniards, and of the plague in Syria, among the French, are but imperfect abstracts from the original works wherein those events are detailed. Our readers will remember that the former numbers of the Med. Rep. contain various and authentic information on these heads.

We refrain from any further notice of a performance chiefly remarkable for its want of information and of order, and which contains, with the exception of a comparative table of deaths in Philadelphia in 1793, 1797, 1798, and 1799, scarcely any thing worthy of the attention either of the student or the reviewer. The death of Dr. R. since the publication of his *first* part, will probably prevent the appearance of a *second.*

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

Account of a Journey up the Washita (or Ouachita) River, in Louisiana, performed by William Dunbar, Esq. and Dr. Hunter.

THESE gentlemen were employed by Mr. Jefferson, President of the United States, pursuant to a provision of Congress for exploring Louisiana, as related at large in our Hex. ii. vol. i. p. 407. They set out from St. Catharine's Landing, on the Missisippi, on the 16th of October, 1804, and proceeded to the mouth of the *Red River*. This is so called from the reddish appearance of the water, caused by some earthy impregnation tinged probably with iron. At a little more than twenty-three miles from the Missisippi they entered the *Black River*, so called from the clearness of its water, looking dark when contrasted with the muddy hue of the *Red River*. They proceeded slowly upwards, passing the place where the River Tensa enters from the east, and the Catahoola from the west, and visiting the station called Fort Miro, about two hundred miles from the entrance below, and which is the out-post of the United States in that quarter. As far up as the junction of the three rivers just mentioned, the country is alluvial and flat, the water sluggish, and the current scarcely perceptible. Immediately above, the high land and permanent strata of soil begin. The latitude of Fort Miro is about 30° 30′. After visiting various settlements, and encountering many difficulties, amidst shoals and rapids in the upper country, they arrived at length at the Hot-Springs, situated toward the source of the river, in latitude 34° 31′.

In prosecuting this expedition, it was discovered that frequent salines or salt-licks existed there. They learned that in the surrounding country, and in the spaces lying far towards the north and west, the rivers Washita, Arkansa, and the Red River, were too brackish to be potable in dry seasons. Salt springs, and plains incrusted with salt, are reported to be interspersed through those regions. On the Washita they saw swans and alligators. About the latitude 33°, the line of demarkation between Orleans and Louisiana,

the long moss or tillandsia almost suddenly ceases, being found no further to the northward; and about the same place the osiers, which grow on the banks of the river, cease, and show themselves further on to the southward.

The party proceeded no further than the Hot-Springs. These are six in number. They are situated about six miles from the main stream to the north-west, as it there runs, and a little above the great rapids. Their heat is too great for the hand to bear; the highest temperature is about 150°. The water, on cooling, is palatable, and very good to drink, having but little foreign impregnation. The body of the mountain from which it issues is silicious, partly flint and partly free-stone; but the superficial parts, which have been overflowed by the effusions from the springs, are incrustated with a stratum of calcareous matter, that, in the course of time, has been deposited from their water. A trifling portion of iron is contained in it too, and precipitated with the lime. In the hot water of these springs a green plant vegetated, which seemed to be a species of the *conferva* growing in such situations; probably the *fontinalis*. But what is more remarkable, a bivalue testaceous animal adhered to the plant, and lived in such a high temperature too. Here they discovered a kind of wild cabbage, which they cooked, and found to be mild and good for food. Between the Hot-Springs and the place where the voyagers landed, are several licks and oozings of salt-water. They relate their surprise at beholding plants, shrubs, and trees at the outlet of the springs, absolutely growing and appearing healthy, while their roots were exposed to a heat of 130°.

The coldness of the weather was very remarkable. On the 30th of December the quick-silver sunk to 9°; on the 2d of January, 1805, to 6°. On this latter occasion, when the temperature of the atmosphere was 6°, and of the river water 32°, a condensed vapour floated over its surface, as is usual in such cases. On January 11th the mercury in the air was at 11°, and in the Washita water at 39°. On the 12th the atmosphere was at 20°, and the river at 40°. In those cases of unequal temperatures much watery vapour hovered over the stream. The observers relate, that although 20° of difference are more than enough to make this exhalation appear visible, yet that 13° of variation are not enough for the purpose. Approximating thereby to Dr. Mitchill's experiments made at New-York in December, 1801, and published in Med. Rep. Hexade i. vol. iv. p. 309.

Above the alluvial country, the rocks were chiefly of a sort of shistus, some of it aluminous, and all of it unfit for covering houses; a kind of silicious composition, resembling oil-stone, or turkey-stone, but too brittle for gun-flints; and a sort of sandy aggregate, which seemed as if it might be employed for grind-stones. The mineralized and carbonated wood was found in several places. There were no certain indications of the proper fossil coal: nor did they meet with any strata of gypsum. And, notwithstanding the heat of the springs, they met with no lava, pumice, or other volcanic matter.

Having, in the course of the voyage, collected, in addition to what has been related, considerable information about the Caddaux, the Osages, and the other nations of Indians which sometimes frequent the Washita and the *little* Missouri, which runs into it; having acquired a good deal of knowledge about the immense prairies, which are compared to Paradises, lying toward the sources of the Red-River and the Arkansas, and having made many astronomical, geological, and meteorological observations from day to day, the adventurers, with their crew of soldiers, got back to Natchez near the end of January, 1805.

From the journal of survey which they kept with all possible correctness, a map of the Washita has been compiled at Washington, by Mr. Nicholas King, and engraved in Philadelphia, by Mr. William Kneass. This is a substantial addition to American geography.

This country was colonized early by the French. They projected and began extensive settlements on the Washita; but the general massacre planned and executed in part by the Indians against the French, and the consequent massacre of the Natchez tribe by the French, put an end to these undertakings, and they were never resumed under the French government.

"The *prairies* of this region are described as plains or savannas, without timber, generally very fertile, producing an exuberance of strong, thick, and coarse herbage. When a piece of ground is once got into this state in an Indian country, it can have no opportunity of reproducing timber; it being an invariable rule to fire the dry grass in the fall or winter, to obtain the advantage of attracting game when the young tender grass begins to spring. Thus the young timber is destroyed; and annually the *prairie* encroaches upon the woodland. It is probable that the immense plains known

to exist in America may owe their origin to this practice. The plains of the Washita lie chiefly on the east side, and being generally formed like those of the Missisippi, sloping from the banks of the river towards the great river, they are more or less liable to the influence of inundation in the rear. This has been known to advance so far in certain great floods, as to be ready to pour over the margin into the Washita. Such an occurrence has however latterly become very rare, and it may be generally estimated that from one-fourth of a mile to a whole mile in depth, will remain exempt from inundation during the high floods." Fishes are not very plentiful in the Washita. In the year 1799, the waters of the Missisippi, during an inundation, dammed up the Washita by regurgitation, to such a degree, that they swelled considerably above Fort Miro. The stagnation and corruption of the water from this cause, destroyed all the fishes in that part of the river; and they have been more scarce ever since. The bois d'arc (bow-wood), or yellow dye-wood, is sometimes seen near the Washita. It bears a gold-coloured fruit as large as the egg of the ostrich; its deep-green foliage resembles that of the orange-tree; and no forest-tree can compare with it for ornamental grandeur.

About three hundred miles above Nachitoches on the Red-River, the navigation is opposed by a very serious obstacle. This is the raft, or natural covering which conceals the whole river for about seventeen leagues, and is continually augmenting by the drift-wood brought down with every considerable freshet. This bridge, which was for a time nothing but floating trees, &c. supports at this time a growth of every thing growing in the neighbouring forest, not excepting trees of a considerable size. And the river may be frequently passed without any knowledge of its existence, so perfectly is it concealed by the superincumbent mass of materials. It is reported that the water is working for itself a new passage through the neighbouring low grounds.

Descriptive Observations on certain Parts of the Country in Louisiana; by Anthony Soulard, Esq. Surveyor-General of Upper Louisiana, in a Letter to J. A. Chevallié, Esq. of Richmond. Translated from the French Manuscript by Dr. Mitchill.

The Missouri, whose sources are still unknown, is, however, already classed amongst the largest rivers. It is an object of astonishment to every body. The uninstructed

man admires the rapidity of its stream, its extraordinary length, the salubrity of its waters, and their uncommon colour. The experienced traveller is astonished at the riches scattered along its banks, and looking into futurity, beholds this rival of the Nile passing through countries as fruitful, as populous, and more extensive than those of Egypt.

The best informed observer can give but an imperfect idea of the riches accumulated on its shores. This note can only point out some of the principal. Happily for our own time, an expedition is now going on, under the auspices of an enlightened government, to explore this river to its sources. What gratitude is due from the whole world to those persons who expose themselves to the greatest fatigues, and even to the greatest dangers, to enlarge the circle of human knowledge in thus bringing, as it were, a new world to our view.

The Missouri unites with the Missisippi about five leagues above the town of St. Louis, in about the 40th degree of north latitude. And it must be remembered, that after this junction, it runs about 1200 miles before it falls into the Gulf of Mexico. But as this part of its course is well known, I shall confine myself to the Missouri alone.

I have ascended this river about 600 leagues, without perceiving any diminution of its breadth or velocity.

The principal streams which fall into the Missouri, as you ascend it, are the *Gasconade*, the *Osage*, the two *Charatons*. the *Grand River*, the *River of the Plains*, the *Nichinan*, the *Batoney*, the *Great and Little Nimahas*, the *Platte*, the *Sioux*, the *Running Water*, and others.

For 25 leagues above its junction with the Missisippi, there are different settlements of American families, especially at *Bonhomme*, *Femmeosage*, &c. beyond these the banks are inhabited by savages only. The Great and Little *Osages*, settled at 120 leagues on the waters called by their respective names, the *Cams*, the *Otas*, the *Panis*, the *Loups*, *or Panis Mahas*, the *Mahas*, the *Pincas*, the *Ricaras*, the *Mandanes*, and the *Sioux*. The latter tribe has no fixed habitation on the Missouri, but visit it regularly for the purpose of hunting.

The borders of the Missouri are alternately forests and *prairies* or cleared plains. The higher we go up this river, the more common are the prairies; and they seem to enlarge every year, in consequence of the fires which overrun them in autumn. These fires are kindled either by the Indians

or the white hunters, sometimes by accident, and at others for the purpose of favouring their hunting.

The water of the Missouri is turbid, and deposits a sediment of very fine sand, which readily falls to the bottom. This admixture, which renders it unpleasant to the sight, diminishes not in the least its wholesomeness. Experience has proved it to be more salubrious than that of the Ohio and the upper Missisippi.

The rivers and streams that empty into the Missouri below the *Platte*, are clear and limpid; but above that river they are as turbid as the Missouri itself. This muddiness is caused by the sandy banks or hills of white earth through or down which they run. The bed of the Missouri is interrupted by shoals, sometimes of sand, and sometimes of gravel, which frequently change place, and consequently always render the navigation uncertain. Its general course is north, a quarter north-west.

To give a precise idea of the incalculable riches scattered along the sides of the Missouri, would require unlimited knowledge. The low bottoms are covered with huge trees, especially the poplar and cotton trees, large enough for first-rate canoes; the sugar-maple; the red and black walnut, so useful to joiners; the red and white elm; the three-thorned acacia, of which impenetrable hedges may be made; the osier; the red and black mulberry; the lime-tree, and the horse-chesnut; all of which are very plentiful. Red and white oak, fit for vessels, and all other sorts of timber, pine, and, on the stony mountains, cedar, are common productions.

I find it impossible to enumerate all the trees which are yet unknown in other countries, and with whose uses and qualities we are as yet unacquainted. The smaller plants are still more numerous; I, however, touch that article superficially, for want of sufficient botanical information. The Indians know the virtues of many of them. Some are used to heal wounds, others to poison arrows; some again for dyeing colours; and they employ certain vegetable simples to cure radically and promptly the venereal disease. They conceal from us, with great care, a plant which renders them for some instants insensible of the most vehement fire. I have seen them take hold of red-hot irons and burning coals without suffering any inconvenience.

The lands in the neighbourhood of the Missouri are excellent, and when cultivated are capable of yielding all the

productions of the temperate climates, and even some of the hot ones; such as wheat, maize, and every kind of grain; common and sweet potatoes; hemp, which seems to be an indigenous vegetable; even cotton succeeds there, though not so well as further south; and the raising of it answers a good purpose for the families already settled on the river: for from a field of about two acres of this they obtain a crop sufficient to clothe a family. The natural prairies are a great resource for them. These afford excellent pasture, and require but little labour to clear them. After one year's exertion, a man may enjoy his fields duly prepared for crops. Brick and potter's earths are very common, and the true Chinese Kaolin is reported, by good judges, to be there, that substance to which porcelain owes its peculiar fineness. And there exist on the borders of this grand river salt-springs enough to furnish salt for the country when it shall become inhabited, and a great deal to spare.

Saltpetre is found very abundantly in numberless caverns near the Missouri. The rocks are generally calcareous; though there is one which is peculiar to this river. It is of a blood-red colour, compact, yielding to a tool, hardening in the air, and receiving the neatest polish. The natives make their pipes of it. The strata are so extensive that there is any quantity that may be wanted for other purposes. There are also quarries of marble; but we know as yet little more than its colour, which is veined red. It is said there is a body of gypsum there; and this would not be difficult to explore. Volcanic productions are also found there, evincing the existence of burning mountains in former times, or in situations now unknown.

The short stay usually made among the savage nations has hitherto been unfavourable to the acquirement of correct information concerning the mines and ores near the Missouri; we know with certainty of none other than those of iron, lead, and coal: but from the accounts given by the Indians, there can be no doubt that tin, copper, and silver, are found in those parts; and particles of gold are said to have been picked up on the surface of the earth, and in the bottom of brooks.

The productions of the Missouri at this time are received from the Indians and the hunters, in exchange for goods and merchandize, and may be exhibited in the following table.

Missouri Produce.

Beaver	12,281 lb. at	$ 1 20	$ 14,737 00
Fox skins	802	0 50	401 00
Bear skins, black, grey, yellow and brown	2,541	2 00	5,082 00
Cow skins	189	1 50	283 50
Deer skins in the hair	6,381	0 50	3,190 50
Bears' grease	2,310 galls.	1 20	2,572 00
Otter skins	1,267 lb.	4 00	5,068 00
Raccoon skins	4,248	0 25	1,062 00
Bison hides or robes	1,714	3 00	5,142 00
Dressed deer skins	96,926	0 40	38,770 40
Tallow and fat	8,313	0 20	1,662 60
			$ 77,971 00

This table, which is made as correct as possible on an average of fifteen years, thus gives an amount of 77,971 dollars, without mentioning musquashes and martins. Calculating at the same rate, the value of the goods carried up the Missouri and exchanged for this peltry, would be 61,250 dollars, reckoning the charges to amount to a quarter part of the worth of the articles. From this it follows that the trade affords an annual profit of 16,721 dollars, or about a profit of 27 per cent.

If the Missouri trade, badly regulated, and without encouragement, gives annually such a profit, there can be no doubt of its increase, if encouraged by government. It must be observed, that the price fixed in the preceding table is that current at the Illinois. If the London price was taken, deducting freight and charges, the profit would appear much greater. If the Missouri, left to the savages, and having but a single branch of trade, affords such great returns, in proportion to the capital employed in it, what might we not expect from individuals or companies with large funds, aided by a numerous population, and devoting themselves to other sorts of traffic. Some of these, I am bold to say, may be undertaken with a certainty of success, when we consider the riches afforded by its banks, and of which, in this note, I have endeavoured to sketch an outline.

Although it was my intention to have written solely about the Missouri, I think I ought, at the same time, to give an account of the mines and licks of salt which lie in the same latitudes on the branches of the *Arkansas*.

At about 300 miles from the village of the Great Osages, in a westerly direction, after having crossed several streams of the Arkansas, the traveller comes to a low bottom, surrounded by hills of a vast extent. This valley is about 15 leagues across. The soil is a black sand, very fine, and so hard that horses scarcely leave any tracks on it. During the hot and dry season, vapours rise from this bottom, which condense and fall back upon the black sand, covering it with a layer of exceedingly white and fine salt about half an inch thick. The rains wash away this accumulation. At about 18 miles from this bottom, he meets with mines of sal gem on the very surface of the earth. The Indians, who are perfectly acquainted with it, are obliged to make use of levers to break it up, and loosen it. At about 15 leagues distance from the last mentioned place, to the south, there is a second mine of sal gem, of the same nature with the first. They only differ in colour; the former being white, and the other of a reddish hue. Further south, and still upon the streams of the Arkansas, there is a saline, which may be considered as one of the most interesting phenomena of nature.

On the declivity of a small hill, there are five holes about a foot and an half in diameter, and two feet deep. They are always full of a very salt-water, but never run over. Dip out as much as you please, there is no apparent diminution; the deficiency is instantly supplied: and about ten feet lower down the hill there issues a spring of pure and fresh water. When these regions become peopled, the transportation of this rock-salt will be perfectly easy, by means of the Arkansas. Experience has proved it to be preferable to every other kind in curing provisions.

If these remarks, made without order, but with a scrupulous regard to truth, should excite the curiosity of gentlemen who possess talents, and are capable of going to the bottom of matters which I have but superficially touched, I cannot doubt that incalculable advantages will result from them, both to the United States and to the territory of Louisiana.

Dated at St. Louis of the Illinois, March, 1805.

Trudeau's Description of the Upper Missouri.

In a manuscript account of the regions situated high up the Missouri, written by JOHN B. TRUDEAU, there is an

account in French, of the people and their expedition once made to the westward, of which the following is a translation:—" The great nation of the *Padas*, which dwells near the banks of the River *Platte*, is distant from the Ricaras settlement on the Missouri, abont 60 or 80 leagues. The *Halitannas*, or *Bald-Heads*, a wandering people, occupy the whole country beyond the River Platte quite to the Arkansas, and to the range of mountains which separate New-Mexico from this part of North-America. When I was with the Chayenne nation, in the summer of 1795, I saw and talked with several chiefs of the *Tocaninanbichez* and *Cayoonas*. On being asked by me, whether in their excursions westward beyond the mountains they had not discovered some river running toward the setting sun; they told me, that about two years before the *Chayennes* and *Cayoonas*, then allies, had formed a strong war-party. The great chief of the Chayennes was one of them; and he related to me the facts himself; that having passed the *Stony Spine*, he reached, after several days' march, the banks of a broad and deep river, where wood grew plentifully, and the water ran towards the west. On the borders of this river, as they went down it, they found seven cabins of unknown Indians. Having attacked and defeated them, there was not a single article to be found in their habitations that had been made by a white-man. All their utensils appeared to be of their own invention. Their huts were covered with rusty matting, and long grass; the skins of beasts, of which the savages make ordinary covering for their tents, being wholly wanting here. Their clothing, bedding, and even the trappings of their horses, were all made of the skins of beavers, otters, cabrys, deer, wolves, foxes, hares, &c. Like all the rest, they use the bow and arrow; and the latter is pointed with bone or stone.

" A small bag of maize which they found among the baggage of this people, prompted them to ask some female prisoners, if their nation cultivated that plant. They said no; but that further down the river, there was a large Indian village, whose inhabitants raised great quantities of it. These women captives had something hanging, by small leather strings, from their ears and necks. On being asked whence they got those ornaments, they replied, that at the termination of that large river, there was an expanse of water too wide for the eye to see across to the other side; that the water rose and fell considerably at certain times of the day

and night; that the neighbouring inhabitants tied large pieces of meat to long strings, which they threw into the water at high tide, and drew out when the swell had subsided; that a great number of shell-fish attached themselves to the meat, and were taken; and that the shells of these were bored and suspended from their noses and ears as ornaments. This is all I have been able to discover concerning the people who inhabit the unexplored tracts beyond the Stony Mountains, and about the land in which they dwell."

This manuscript of Mr. Trudeau was politely put into Dr. Mitchill's hands by Mr. NICHOLAS BOILVIN, at Washington, during the winter 1805-6. The writer, who had travelled much to the westward, inscribed his work to the Spanish Governor of the Illinois. It contains, 1. A description of the Upper Missouri; 2. A sequel to that description; 3. The opinions of the Indians as to their origin, faith, and ceremonies in religious matters; 4. Mode of making peace, smoking the great pipe, and dancing in different ways, such as the calumet-dance, the sun-dance, and the bull-dance; 5. Conduct of the sexes toward each other, and marriages; 6. Their wars.

The physical geography, and trading intelligence contained in this manuscript, has such a near resemblance to that described in Mr. M'Kay's narrative, that it was deemed unnecessary to translate any more than the foregoing passage.

Lewis's Map of the Parts of North-America which lie between the 35th and 51st Degrees of North Latitude, from the Missisippi and the upper Lakes to the North Pacific Ocean.

It is generally known that under an act of Congress, passed February 28, 1803, for extending the external commerce of the United States, two enterprising officers, Captains Lewis and Clarke, were dispatched by the President of the United States, to explore the regions bordering on the Missouri, to ascend that river, and to penetrate, by means of its tributary streams, or otherwise, quite across the continent of North-America to the western ocean.

So diligently have those travellers employed themselves, that numerous evidences of their industry have already reached the seat of government. Many of the natural productions of the countries they visited have been, from time to time, forwarded to Mr. Jefferson, in addition to their letters and other written information. Nor are these all; Cap-

tain LEWIS has compiled, during his absence, from the authorities of the best informed travellers, and from his own observations, *A Map of those parts of North-America situated between the 35th and 51st degrees of latitude, and the 89th and 124th degrees of west longitude.* A manuscript copy of this has been forwarded to the Secretary at War; and, under the direction of Gen. Dearborn, other copies have been made for the inspection of Congress. The Missouri, on this map, from St. Louis, where it joins the Missisippi, up to Fort Mandane, is accurately delineated, and the work corrected by astronomical observations. Fort Mandane is in lat. 47° 21′ 47″ N. and long. 101° W. The country west of Mandane is laid down principally from information collected among the natives. This map contains a grand display of waters and mountains heretofore very little known to geographers; and Mr. Nicholas King, the draftsman, has performed his part with great elegance, on a scale of fifty miles to an inch.

This map will not be engraved and offered for general use before the voyagers return from their expedition. They may be then expected to publish a narrative of their journey and discoveries. And it is expected these new facts in geography will form a part, and a most valuable one too, of their book of travels in the west. From the last accounts, there is reason to believe the two gentlemen and their party are safe and on their return. In the course of 1806 they will probably show themselves once more at home, and gratify the curiosity and anxiety of their fellow-citizens.

From the documents collected by Capt. Lewis, it appears that the chain of northern Cordillieras, called the Rocky or Shining Mountains, runs in a northerly and southerly direction, not very far from the ocean. The streams and rivers, therefore, which fall into the sea from the western side of this barrier, are few, small, and precipitous, except the Columbia River, whose two principal branches, coming not from the east, but from the north and south, are of considerable size and length.

From the east side of this great dividing ridge, in about long. 119° W. in lat. 40° N. and not more than 60 miles to the eastward of the southernmost branch of the Columbia River, the Missouri takes its rise, in the country of the *Snake* Indians. Its course is at first northwardly, and then north-eastwardly, through the land of the *Big-belly* Indians, between the mountains, until it descends in a grand cataract

over their easternmost chain, in lat. 47°, and long. 112°. Having arrived to the plains, it proceeds east with a considerable inclination northwardly, to the meridian of 106°; and there its extreme northern bend is in lat. 49° nearly: then it turns a little southwardly, and runs by the place where the party under Captains Lewis and Clarke wintered in 1804-5, in the *Mandane* country. Passing this, it turns almost south, and runs sometimes even westward of south, through the *Ricaras* land and the *Sioux* country, until after it receives the White River in lat. 43°. After this it turns eastward to the *Mineral Bluffs*, in long. 98°, and lat. 43°; and afterwards pursuing a general direction south-eastwardly, joins the Missisippi a little above St. Louis, in long. 90°, and lat. 38° 40′. From its source to the point of union with this latter river, it traverses a portion of earth equal to twenty-nine degrees of longitude.

Of the waters which the Missouri receives, the *Yellow Stone*, the *Chyenne*, the *Rapide*, the *Platte*, the *Kanzas*, and the *Osage*, which fall into it from the south and west, are vast rivers; and the *Scalding*, the *White earth*, the *James* and the *Sioux*, which enter it from the north and east, are also large streams, though inferior to the former. The number of smaller water-courses, connecting themselves with the main current, is remarkably great.

The land where the Missouri originates, gives rise to other large rivers; for the *Rio des los Apostolos*, and the *Colorado*, which fall into the Gulf of California, the *Rio Bravo*, which terminates in the Gulf of Mexico, the *Red River*, and the *Arkansas*, which discharge their contents into the Missisippi, and the *Platte*, which pours its streams into the Missouri, all take their rise in the same neighbourhood; that is to say, they derive their sources from the same cluster of mountains.

So extensive and vast is the appearance of the Missouri and of the rivers which are connected with it, that the Missisippi and its auxiliary streams seem diminutive and insignificant in comparison with them. The former certainly takes rank with the Oronoko, the Amazons, and the La Plata, the largest of the rivers in South-America.

These discoveries teach us that the head of the Missisippi is south a little westwardly of the Lake of the Woods; and that the great northern arch of the Missouri is in a considerably higher latitude than the north-eastern source of the Missisippi proper in *Red-Cedar Lake*, and the north-west-

ern in *Leaf-Lake*. From the country situated north and east of the Missouri, and north of the Missisippi, the waters run by the *Assiniboine*, the *Saskachawin*, the *Dauphin*, the *Winnipik*, and other rivers, into the great northern reservoir called the Winnipik Lake.

The principal places where native salt abounds, are on the head waters of the Arkansas. They are particularly noted in a manuscript in Dr. Mitchill's possession, executed by Mr. Soulard, the Surveyor-General of Louisiana. They are likewise marked in this map of Capt. Lewis.

It is worthy of remark, that the testimony of the Osage Indians, at Washington, confirmed much of what is delineated on this map. Dr. Mitchill requested some of them, during the winter 1806, when they were visiting him one evening, to make him a delineation of all the countries they knew, with chalk upon the floor. They proceeded with remarkable readiness and correctness, to draw the rivers, paths, and villages which they had visited; and marked very distinctly the great Saline. The geographical knowledge which the Indians possess is, in Dr. Mitchill's opinion, by far more extensive and respectable than is believed by those who are not acquainted with them. And he hence considers that the information given by them, to a skilful surveyor or traveller, may often be so correct as to enable him to approximate very near to the truth. The large map made by the Indians, on a Bison hide, for Mr. Jefferson, is a most impressive proof of the proficiency made by those children of nature, in the physical geography of the western country.

Dr. Mitchill's Experiments on the Saline Efflorescence of Walls in the City of New-York, showing the faulty Constitution of Mortar.

Small crystals of a saline matter had for several years overspread the inside of the north wall of Dr. Mitchill's dwelling house. At length, in July 1805, a parcel of this wall-salt was carefully gathered.

On putting it into clean rain-water, a parcel of matter, partly the carbonate of lime and partly the sulphate of lime, from the wall, fell to the bottom. On letting the liquor grow clear, and decanting it off, he added a solution of carbonated soda, which caused not the least cloudiness or precipitate. Judging from this that there was no salt with an *earthy* or *metallic* basis in the mixture, he added a solution of muriated

barytes, and this became white and fell down in a copious sediment, indicating the presence of sulphuric acid. He then added nitrate of silver to the clear solution of wall-salt, and saw it instantly decomposed. The precipitate, which was white at first, soon changed to a brown and then a dark colour; giving room to suppose the presence of muriatic acid. Sulphuric acid poured upon some of the salt caused a brisk efflorescence, with extrication of gaseous bubbles apparently of carbonic acid. On making this experiment, there was no sign, either to the sight or smell, of saltpetrous fumes.

Hence it may be concluded, that the three acids, the sulphuric, muriatic, and carbonic, existed in this specimen of wall-salt. In the absence of *earthy* and *metallic* bases, the acids must have been combined with *alkaline* neutralizers. From the plenty of muriated soda, and of carbonated and muriated pot-ash in the water of the pumps and gutters whence mortar is made in our streets, it is easy to conceive that this wall-salt consists of at least six neutral compounds; to wit, sulphate of pot-ash, sulphate of soda, muriate of pot-ash, muriate of soda, carbonate of pot-ash, and carbonate of soda. In cases where septic vapours abound and attach themselves to the plaster of walls, the septates (or, as they are called, the nitrates) of pot-ash, soda, and lime, may also be formed. As these neutral salts form no inconsiderable part of the mortar generally in use, it may be easily understood wherefore our walls which are exposed to the weather and wet have so little durability, losing their adhesion and crumbling away.

Crozat's Islands in the Southern Hemisphere.

In latitudes considerably further south than that of Tristan d'Acunha lie five or more rocky islands; some of which have not been often visited or seen. Their situations are alleged by our navigators to be wrong even in the best charts. They are scattered about at considerable distances; and as the positions of several of them are uncertain, they can only be found by being cruised for. And sometimes they are so enveloped in clouds and fogs, that the search has been given up as fruitless. In 1804, ten or more vessels from different places had met at these remote islands, for the purpose of killing fur-seals. Three were from New-York; and one of these had been fortunate enough to fall in with one of the

least frequented islands, where she soon took on board the skins of sixty thousand of those animals. With these and some thousand more to make up her cargo, drawn from the depths of the ocean as it were, she was to sail for Canton, and exchange the furry peltry of Crozat's isles for the cottons, silks, toys, and teas of China. While occupied at these islands, it is customary to procure refreshments for the people from the Cape of Good-Hope, as the nearest inhabited land.

Simsbury Prison in Connecticut.

Concerning the unhealthiness of the vapours from this exhausted mine, now turned into a place for the confinement of criminals, the following particulars have been communicated by a correspondent.

"I have frequently heard that the guard at the Simsbury mines, in Connecticut, are subject to sickness to an alarming degree; and some have lost their lives by it, when, at the same time, the prisoners have enjoyed a very good state of health. This led me to make inquiry into the situation of the place, from which I gained but little satisfaction, until I saw a drawing and explanation of the prison, said to have been done by one of the prisoners. By this I find the prisoners are lodged every night in a deep mine, the shaft or entrance of which is secured by a trap-door; and for their better security, there is a dwelling house erected over it. At some considerable distance from this door, there is a well, and a communication from the well to the prison. I have likewise been informed that a very strong current of air presses up the shaft into the house. Now, supposing this information to be just, it is very easy to account for the people residing in the house being sickly, and as easy to remedy the evil. This I will just mention as it appears to me, and leave it to your better judgment. Let a trunk be erected at the shaft of six or eight inches square, and run through the house out at the ridge, and keep the door shut as much as possible. My intention in troubling you with this, is only to put you on the track, making no doubt you will inquire into the matter, and give them your advice in your own way."

Facts concerning Aurora Borealis.

Mr. Isaac Porter, Mr. Thomas Gross, and Mr. Ignatius Thompson, of Hartford, in Vermont, in the month of Oc-

tober made the following observations on a remarkable meteor which appeared there. They seem to prove that the *northern lights*, as we call it, is neither very high in the atmosphere at all times, nor very distant from the spectator on an horizontal line. They relate the appearances in the following words, which certainly add materially to our knowledge of this curious phenomenon:—

"On Sunday evening last, we apprehend between seven and eight o'clock in the evening, from the windows of the Rev. Mr. Gross' house, Hartford, Vermont, we noticed the Aurora Borealis; the bottom of it, elevated but a few degrees above the horizon, lay in a regular line, very bright, and not much wider than the rainbow; above that, in several places, streams shot up towards the zenith as usual. We had not viewed it long before we observed that the eastern part of it had settled so low as actually to be between us and the high lands on the north side of White river; the height at the distance from us perhaps of about one mile and a half.

"The meteor, we apprehended, must be nearly perpendicular to White river, and distant perhaps about half a mile. It would have gratified our curiosity, could some of us have been on the height beyond the White river, to have made our observations upon it, as it must have been between us. This we certainly concluded, however, that it would be needless for us to go to the north pole for it. There had been considerable rain for the preceding day, the air was warm, and some fog towards evening lay along upon White river, and the luminous meteor rather appeared to be intermingled in the fog."

Remarkable Consequences of full Diet, and particularly of free Drinking, in the Gothic Nations and their Descendants.

The Gothic nations were famous of old in Europe, for the quantities of food and drink which they consumed. The ancient Germans, and their Saxon descendants in England, were remarkable for their hearty meals. Gluttony and drunkenness were so common, that those vices were not thought disgraceful; and TACITUS represents the former as capable of being as easily overcome by strong drink as by arms. Intemperance was so general and habitual, that nobody was thought to be fit for serious business after dinner. And under this persuasion it was enacted in the laws of the Lombards, that *judges* should hear and determine causes

fasting, and not after dinner. MURATORI, in his Italian antiquities, plainly affirms, that this regulation was framed for the purpose of avoiding the unsound decrees consequent upon intoxication. And Dr. GILBERT STUART very pertinently and ingeniously observes, *in his historical dissertation concerning the antiquity of the British constitution*, p. 238, that from this propensity of the older Britons to indulge excessively in eating and drinking, has proceeded the restriction upon *jurors* and *jurymen, to refrain from meat and drink, and to be even held in custody*, until they had agreed upon their verdict.

The descendants of those nations, who form the greater part of the population of the United States, may feel a gratification in knowing the origin of this restraint upon juries.

Dimensions of the Skeleton of the extinct Species of Elephant dug up about seventy Miles North of the City of New-York, in 1801.

For the facts relative to the discovery of the huge fossil bones in Orange and Ulster counties, west of the Hudson, at Newburgh, we refer our readers to Med. Rep. Hex. i. vol. iv. p. 211. The subsequent success of Mr. Peale, in purchasing the bones which had been found in 1799, in disinterring a great number more, and in connecting them together so as to form an almost entire skeleton, is very generally known. We extract from a publication of his son, Mr. Rembrandt Peale, the dimensions of the skeleton thus composed. The publication we mean is his "Historical Disquisition of the Mammoth," printed at London, in 1803. 8vo. pp. 91.

Dimensions of the Skeleton.

	Feet.	Inches.
Height over the shoulders	11	0
Height at the hips	9	0
Length from the chin to the rump	15	0
From the point of the tusks to the end of the tail, following the curve	31	0
Length in a straight line	17	6
Width of the hips and body	5	8
Length of the under jaw	2	10
(Weight of the same, 63½ pounds.)		
Width of the head	3	2
Length of the thigh bone	3	7
Smallest circumference of the same	1	6

Length of the tibia	2	0
Length of the humerus, or large bone of the fore-leg	2	10
Largest circumference of the same	3	2½
Smallest circumference of the same	1	5
Length of the radius	2	5½
Circumference at the elbow	3	8
Length of the scapula	3	1
Length of the longest vertebra, or bone of the back	2	3
Longest rib, without cartilage	4	7
Length of the first rib	2	0
Length of the breast-bone	4	0
Length of the tusks	10	7
Circumference of one tooth, or grinder	1	6½

Weight of a tooth, 4 pound 10 ounces.
Weight of the whole skeleton, about 1000 pounds.

Conchology of New-York and its Vicinity.

Mention was made in Med. Rep. Hex. ii. vol. i. p. 198, of the numerous species of shells discovered by Mr. Samuel Akerly, in the waters of New-York and the neighbouring places. We now announce, with additional pleasure, the further progress made by that active inquirer into this branch of natural history. The sorts of testaceous animals are found to be more numerous than any person who had not attended to the subject would have thought credible. To the forty-four species which Mr. Akerly had arranged in his cabinet two years ago, he has already added twenty-one other species, sixty-five in all. These he has arranged and distributed according to system; and they make a fair and instructive exhibition of the shells produced along the sea-coast, and in the fresh lakes and streams of that part of America. Their names and number, as corrected, are as follow, and doubtless not a few of the species are non-descripts:

I. MULTIVALVE.—*Lepas*, or Barnacle, two species.

II. BIVALVE.—*Mya*, or Pisser, four; *Solen*, or Razor, three; *Cardium*, or Cockle, three; *Donax*, or Surf-shell, two; *Venus*, or Clam, one; *Arca*, or hairy Clam, three; *Tellina*, two; *Ostrea*, or Oyster, one; *Pecten*, or Scollop, one; *Anomia*, or Golden-shell, one; *Mytilus*, or Mussel, five.

III. UNIVALVE.—*Bulla*, one; *Voluta*, three; *Buccinum*, or Whelk, three; *Murex*, or Periwinkle, four; *Turbo*, or Wreath, five; *Helix*, or Snail, fifteen; *Patella*, or Limpet,

two; *Serpula*, or Pipe-worm, two; *Sabella*, or Sand-worm, one; and *Teredo*, or Borer, one.

Among other researches of this gentleman, is his observation that the marle of Orange and Ulster counties abounds with living animals of the testaceous order. The swamps and pits containing that calcareous substance are replete with myriads of such creatures crawling among it. Four species of these have been discovered, two of which are helixes. From the remains of their preceding generations, the inanimate part of the marle has already been formed; and from the exuviæ of their present and future generations, will their places of abode continue to be supplied with additional quantities of the same material. Considering the great utility of this substance as a manure, the prospect of its speedy re-production must be very agreeable to farmers.

Mineralogical Description of the Country near the Wall-kill and the Shawangunk Mountains, in New-York. By Mr. Samuel Akerly, in a communication to Dr. Mitchill, dated December 23, 1804.

That part of Country which lies between Shawangunk mountain and the Hudson river, includes the whole of Orange county, and that part of Ulster which lies to the southward of Kingston. It is nearly bisected by the Wall-kill, which has a course of about ninety miles, running N. E. and parallel to Shawangunk ridge. The Wall-kill has its source in New-Jersey, in the N. W. part of Sussex county, and joins the Hudson near the village of Kingston. The Shawangunk ridge rises in New-Jersey, and has its course parallel with the Delaware, till it passes into New-York, when it continues to run N. E. and ends at the Rondout-kill, or Rosendale, where it joins the Wall-kill, within six or eight miles of Kingston.

The southern part of this tract is included in your granitical division of the State, and in this part there is nothing new to add, as I observed no new modifications of granite or gneis, or any remarkable combination of this earth, nor any other strata to superabound. In the northern part of Jersey, however, there are three forges, which are supplied with iron ore, of a good quality, from the Highlands, in Orange county. In these mountains iron ore must abound, as it does in the mountains of New-Jersey. On the east side of the Hudson I ascended the mountains, and saw two places where wells had been sunk (on Mine hill, back of An-

thony's Nose), though now filled up, and worked before the war, had been deserted, as nothing but iron had been found. Here I collected a quantity of vitriol of iron crystallized on the rocks, and some pyrites. On a mountain near Newburgh, flames have been seen to issue from the earth, close by a mineral spring, whose waters create sickness and nausea, and are said to be tinged with copper.

The next portion of this country is in your second division, viz. the Shistic. Slate predominates in this part, as may be seen along the Hudson, from the highlands to the mouth of the Wall-kill. This underlays the surface to Shawanguuk mountain, and probably extends beyond it. The eastern bank of the Hudson is high, but not greatly elevated, and for some distance back is hilly, but not mountainous. Between this and the mountain runs the valley, through which the Wall-kill has its course over its slaty bed. The soil is in general good, and somewhat loamy. In the neighbourhood of the Wall-kill there are excellent meadows, which fatten cattle to a vast size, and afford excellent butter for the New-York market. The inhabitants principally use coarse salt in its manufacture, which is not so much the case on Long-Island, where the butter soon becomes rancid, from the bad quality of the Liverpool salt. Though this is not far inland, and the Hudson is brackish as far as Newburgh, yet the farmers are obliged to salt their stock two or three times a week.

A quarry has been opened in the town of New-Paltz, which affords very good slate, and will in a short time, with due encouragement, supply our home consumption. All over this extent of surface are scattered detached masses, and amorphous pieces of calcareous petrifactions of marine shells, and apparently animals, as you have seen in the Italian specimen in my possession, and those from Hudson. Most of these are in a state of decomposition, and put on a cinerious appearance, as those you have seen from New-Jersey. Several species of shells, which are not at present in our waters, are found in these calcareous rocks. When I give you an account of other shells, I shall endeavour to describe such as I have seen.

That part of Shawangunk mountain which I visited, facing the east, consists at the top of granulated quartz. In some places it is finer grained, and approaches near to the sand stone. Its colour varies, but is generally of a greyish white. At the top, facing the east, the rock forms precipices between

two and three hundred feet, which appear white at a distance; it slopes off gradually on the west. The rock splits horizontally in many places, every foot or eighteen inches, so that the labour is less in procuring millstones, which are got on the west side of the mountain, in the town of Rochester, and are carted near thirty miles to Kingston landing, and hence called Esopus stones. This stratum is only on the top of the mountain, does not descend deep, and stops at the Rosendale. Near where I ascended, native alum has been found on Mr. Brown's farm. Lead has been found in its native state near the alum, and now a person is working with the hopes of finding gold. I have some of the earth from the alum mine, which is highly impregnated with aluminous particles.

There are a number of salt-licks or springs on this mountain, to which the deer and other wild animals resort, and where the hunters lay in wait for them.

The Esopus mill-stones have come in pretty general use in the territory of the United States, but still the burr stones are reckoned the best. This stone is of a closer grain, finer grit, and harder than Esopus stones; it is somewhat porous, and is the arid quartz of Kirwan. It is found only in France, at Abregress, on the river Marne, and not to be obtained in such large masses as on Shawangunk mountain, and is of course put together by plaister.

Where the quartz of Shawangunk mountain ceases, the slate elevates itself with frequent masses of calcareous rock, till near Kingston village, when it gives place to lime-stone, which abounds about and to the westward of the village, almost every house of which is built of it. It is of a fine grain, nearly black, pale blue, greyish, with a variety of other coloured veins. Near the village is a cave, formed by the falling asunder of the rocks under ground. Here I saw petrifactions in the rocks, but did not enter the cave, owing to its dampness and the excessive heat of the day. There is a still larger one in Marbletown, about fourteen miles from Kingston. Of this the Rev. Mr. Warden said he intended to send you an account.

There is a probability of the former existence of a great many of the animals called the Mammoth in this tract of country, as may be judged from Dr. Graham's letter in the 4th vol. Med. Repos. p. 213. The swamps and marle pits in which the bones are found, are well described in Mr. Sylvanus Miller's letter to you, in the same volume, p. 211. I would only

remark as to the formation of the marle, which is mostly calcareous earth, full of small shells, in a state of decay, as my opinion, that the formation of it is still going on under present circumstances. The marle, when pure, is white, and generally covered with a loose bog. It even sometimes rises to the surface, and is only found where there is a living spring, which seldom issues above ground. Among the marle are found several species of shell, and though I saw no live ones, the farmer who accompanied me said he had seen them alive, when digging marle. The animals which inhabit the shells must have the power of forming marle, as well as constructing their own shells, which decaying when the animal is dead, help the process.

Thus I think the formation of marle is still going on, though in talking with Dr. Graham, of Shawangunk, he was of a different opinion, as he had never seen any of the living shells; but I have found two species, which I saw among the marle, both in the Wall-kill and Hudson.

The marle is frequently used as manure, but the labour and difficulty of procuring it, in comparison of buying gypsum, make it the dearest, so that as plaister is not decomposed here by a saline or maritime atmosphere, it answers exceedingly well, and supersedes the use of marle

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Soda employed for the Mouth and Stomach among the English.

A theory of the manner in which alkaline lotions and dentifrices preserve the teeth and gums, was published in our Hex. i. vol. ii. p. 425, 3d edit. In this it was shown how weak solutions of carbonated soda and pot-ash neutralized the *septic acid* formed among the teeth, and between them and the gums, and thereby freed them from that destructive agent. And while the whole inside of the mouth was thus deterged and purified, there could be no injury done to the teeth, which are phosphates of lime, because the phosphoric acid has a stronger attraction for lime than for alkalies of any kind. For the particular illustration of that branch of the American doctrine of pestilential fluids, we refer to the above mentioned memoir.

In the present year, the London newspapers contain various projects for bringing soda into use. One of them is by W. & J. Frazer. They prepare their soda, by burning sea-weed, and selling the ashes for a tooth-powder. Also A. S. Burkitt, chemist, advertises *soda-water* as an excellent kind of remedy for the stomach. This preparation

affords much free fixed air, in addition to the alkali. The soda is sold in the form of a powder, a table-spoonfull of which is enough to impregnate half a dozen tumblers of water. It is recommended to families which travel, especially to the East and West Indies. In London they offer also to the public something which is called *concrete acidulated soda for making soda-water*. This kind of artificial mineral or medicinal water is stated to have been used for a considerable time at the tables of the opulent. For an explanation of the operation of this alkali, and the carbonic acid detached from it upon the stomach and intestines, see Mitchill's letter to Percival, in Med. Repos. Hex. i. vol. i. p. 253, 3d edit. and his epistle to Woodhouse, vol. ii. p. 274, 3d edit.

Prize Medals offered by the Humane Society of Philadelphia.

"The society have observed, with gratitude and admiration, the labours of the many learned and ingenious benefactors of mankind, who have advanced to an high degree of improvement the means to be employed in restoring to life those who have been apparently deprived thereof. But they have at the same time to regret, that notwithstanding much good hath been done, yet these means very often fail of success. In order to excite public attention towards the further improvement of so important a part of medical science, the society is induced to offer, for the best dissertation on the means of restoring to life persons apparently dead from drowning, and more effectual than any yet in use, a *gold medal*, value fifty dollars; for the second best, a *silver medal*, value twenty five dollars.

"The dissertations to be sent to the secretary of the society (post paid) by the first day of January, 1808.

"They may be written in the English, French or Latin language; to be accompanied with a sealed paper, containing the author's name and place of residence; which is not to be opened unless the prize is decreed.

"They shall be submitted to the judgment and decision of the Medical Professors of the University of Pennsylvania.

"The society entertain the pleasing hope, that to some of their fellow citizens is reserved the heart-felt satisfaction, and honourable reward, of improving this truly interesting part of useful knowledge; and of announcing to the world an important addition to the means already in use for restoring suspended animation."

Garnett's Edition of the Nautical Almanac.

The British government, long ago, patronized and encouraged, in a particular manner, the arts and sciences subservient to navigation. Among other displays of this munificent spirit was the establishment of a Board, denominated the *Commissioners of Longitude.* The gentlemen of this association have considerable powers vested in them by parliament. In pursuance of the authority so vested in them, they present the public annually with a *Nautical Almanac*, or *Astronomical Ephemeris.* The publication of this laborious work, which is eminently conducive to the improvement of geography, navigation, and astronomy, was begun in 1767; and has been continued yearly ever since. The astronomer royal, at present Dr. Maskelyne, immediately superintends and sanctions the publication.

The five last annual numbers of this work have been regularly re-printed in America. They proceed from the press of Mr. A. Blauvelt, at New-Brunswick, in the State of New-Jersey; and are carefully revised by JOHN GARNETT, Esq. the ingenious gentleman by whom *Clarke's Seaman's Desiderata* were several years ago re-published in the United States.

The Nautical Ephemeris for 1808 is already finished, and has been for some time in the shops for sale. To practical navigators there is no need of describing it. But some little account of it may, perhaps, not be unacceptable to other persons. It is a calendar, distributing the solar year into twelve months, according to the common computation of time. The calculations, except those of the eclipses of Jupiter's satellites, are made according to the apparent time of the Royal Observatory at Greenwich. Those phenomena of the secondaries of that planet are now reduced to equated or mean time. The day is divided into twenty-four hours, without stopping at the end of twelve at noon, and beginning another series of twelve; and its commencement is at noon, and not at midnight, as in reckoning the civil day.

To each month twelve pages of the book are devoted. The day of the week, the day of the month, the remarkable days in the Church, &c. and the phases of the moon, with eclipses and other celestial and planetary occurrences, occupy the four columns into which the first page for each month is divided. In addition to the daily and weekly columns, the second monthly page exhibits the sun's longitude, right ascension in time, declination and the equation of time, with

its difference from day to day. The astronomer finds, on the third page, the time when the sun's semi-diameter passes the meridian, tables of the sun's semi-diameter, his hourly motion, the logarithm of his distance, and the place of the moon's node; together with the eclipses of the satellites of Jupiter. The longitudes and latitudes of the planets are given on the fourth monthly page. And besides the heliocentric and geocentric calculations on them, their respective declinations and times of passing the meridian are laid down. The navigator finds in the 5th, 6th, 7th, 8th, 9th, 10th, and 11th pages of this ephemeris for each month, the moon's place, and all the circumstances relative to her motion and her distance from the sun, and the proper stars from which her distance ought to be observed for finding the longitude at sea. The longitude, latitude, and declination of the moon, and the right ascension, semi-diameter and horizontal parallax are computed twice a day, to noon and midnight. And her distances are generally computed from one starry object on each side of her, to afford the mariner greater opportunities of observation, and the means of being more exact. The configurations of Jupiter's satellites are expressed on the 12th and last page. Thereon are seen their apparent positions in respect to one another, and to their principal.

A valuable improvement of computing, by a new method, the declination, right ascension, &c. of the moon; logarithmic tables, to answer the purpose of a table of proportional logarithms; and a new and simple method of working the lunar observation, with blank forms of the same for seamen, are some of the numerous additions which the industry and science of Mr. Garnett has made to this useful and important publication.

Moseley's Testimony in Favour of the Acescency of Animal Excretions.

This intelligent writer, who practised physic twelve years in the West-Indies, quotes from Hillary the following paragraph (climate of the West-Indies, p. 99): "The common sweat, even of persons who are well, when tasted in the West-Indies, is so very salt and acrid, that it tastes like the salt, or spirit of hartshorn mixed with water." "I cannot say," he then adds, that "I have ever found this remark verified, but, generally, on the contrary; from the climate being unfavourable to animalization, the sweat has a nearer affinity to the spirit of vinegar. All the fluid excretions are

impregnated with an *acid* acrimony, and the sweat is so to so great a degree generally, that the rooms of sick people smell like the steam of acid preparations. And I have always observed, that the use of aromatic scents, and the burning of fragrant woods and herbs were more refreshing to the patient, and cleansing to his chamber, than the sprinkling of vinegar and the use of acids. The idea that every thing in hot climates inclines to putrefaction, by the alkalescent disposition of the animal juices, while life remains, appears to me totally void of foundation."

Yapon-Tea, or Black Drink.

In the maritime parts of North-Carolina, particularly in the sands and beaches, there grows an ever-green shrub, whose leaves and branches are employed to make watery infusions for drink to the inhabitants. This plant is said to be the *Ilex Cassine.* Almost all the southern coasters who frequent the port of New-York, are in the constant use of Yapon-tea made from this vegetable. They employ it as a gentle astringent, giving strength to the stomach, and guarding the constitution against the intermittent and other fevers which reign among the swamps, ponds, and marshes of that low and foggy region. It is also used for the purpose of correcting the bad quality of the water. Near the bays and sounds which indent this curiously diversified coast, the well-water is so disagreeable as to be scarcely fit to drink without something to disguise its flavour, or to correct its noxious qualities, and the good sense and experience of the people have convinced them that yapon is a better ingredient for this purpose than rum, whiskey, or any kind of ardent spirits. It is used also in diet, like the teas of China; and many of those who consume it, prefer it to souchong, and even to coffee. A Carolinian, therefore, who drinks the infusion of the ilex cassine, accomplishes three good objects at once; for while he corrects thereby the faults of the water, he renders that very water a remedy to the diseases induced by the climate, or turns it to an agreeable and tonic article of aliment.

It is said that the celebrated *black drink* used by the Indians of the Creek nation is prepared from the same species of plant. By scorching the leaves a little, and adding a large proportion of them to the water, a dark-coloured infusion is procured, which is always served up and handed round at their treaties and solemn meetings on business.

When duly prepared and poured from one calabash to another, it froths almost like fermented liquor; and while it is circulated in this strong, black, and foaming state, every individual, both of the Creek tribes, and of the strangers and visitors, must taste and swallow a portion of it, before and during the deliberation on public affairs.

Thus the Creek Indians ascribe to the yapon cooling, composing, and invigorating effects, and they distribute the infusion of it with great form and ceremony.

The common method of preserving the ilex for use, is said to be this: At a convenient time in autumn, the extremities of the branches, consisting of the twigs and leaves, are plucked off; they are then cut with a hatchet to pieces, small enough to put into a tea-pot. From this manner of treating it, the yapon consists of leaves and sticks mingled together; then a quantity of it is thrown into a barrel or hogshead, and sweated and browned by putting hot stones into the midst of it. After undergoing this operation, it is spread and dried for use in the shade.

The taste of the drink made from it is not very different from that of bohea tea. There is nothing unpleasant and nauseous in it, and, by a little use, persons grow extravagantly fond of it. The dry material is commonly sold by measure, and the price in Carolina is about a dollar the bushel. There can be no doubt, if the leaves of this wholesome plant were picked at the most proper time, separated from the sticks, and cured without being burned or smoked, that their flavour would be greatly improved, and that they might be brought more extensively into use, at least among the citizens of the United States, if not among foreigners.

Sulphate of Barytes in New-Jersey and Maryland.

There is a vein of terra ponderosa on the west side of Paulin's hill, about six miles from Sussex county, in New-Jersey. It is in a vein which varies from two to three paces in width, and has been traced for an hundred yards in length. A large quantity of barytes also exists in the Sugar-loaf mountain, not far from the junction of the Monocasy with the Potomack, in Maryland.

FOREIGN.

From a learned and obliging correspondent in Germany, we have received the following articles of medical intelligence, concerning that important portion of Europe.

DR. *Joseph Frank*, first physician of the Universal Infirmary at Vienna, has published at Heilbron, *Erlauterungen der Erregungstheorie;* which is a new edition of his Illustrations of the Brunonian System of Physic, published in 1797. This new edition is very remarkable, because the author, who six years ago was the first and most strenuous advocate of the Brunonian theory, now publicly confesses that, taught by practice, he is obliged to abandon it, and to revoke mostly his former tenets. Though he does it without any injustice towards Brown, he has been opposed, and even insulted, for his apostacy, by the arch Brunonian Professor Roschlaub, at Landshut, who wrote against him in the billingsgate manner. Dr. J. Frank, as well as his father, remain at Vienna. They both had accepted a very honourable and lucrative appointment as professors at Wilna (now a Russian university); but the father fell into a dangerous disease, whereof being recovered, he resolved rather to remain at Vienna, though he had already abdicated his employment as professor at that university. He confines himself now to his extensive practice.

Mr. Blair's new Experiments on Venereal Diseases have been translated into German by Dr. *Struve*, and *Swediaur*'s Treatise on the same subject, in three vols. by Dr. Joseph Eyerel, at Vienna. This last work has also been translated into German by Professor Sprengel, at Halle, which is said to be the best. A third translation was published by *Van Hoven*, at Ludwigsburg, Swabia.

The fourth part of *Reil*'s *Ueber die Erkentniss und kur der Fieber* (on the diagnosis and cure of fevers), has been published in 1804. It contains the nervous febrile diseases, and especially a theory, &c. of insanity, and the cure thereof. Our physicians praise this work for the new light it affords.

Hexhold's *Uebersicht der Mechanischen und Chemischen Mittel zur Reinigung der Luft in Hospitalern*, &c. i. e. View of the Mechanical and Chemical Means of purifying the Air in Hospitals, Prisons, Mines, Ships, &c. is translated from the Danish, by Dr. Tode, Copenhagen, 1802. It contains only a useful description and critical review of all the known

improvements. This is a useful compilation. The translator, though a veteran in medicine, is to be accused of negligence in style.

Dr. *De Sacco*, at Milan, has made experiments, which prove that the lymph of the malanders, or rather *the grease* of horses (Italian *Giardoni*, German *Mauke*, French *Eaux aux jambes*), has the same effect, when inoculated, as the vaccine. These experiments have been repeated several times at Berlin, by Dr. and Counsellor *Bremer*, who got the reproduced lymph from Vienna. He transplanted the lymph by four generations, and it remained effective. All necessary means have been employed to ascertain that *true* cowpock was produced. This disease in the skin of horses is also found in asses and mules, but exceedingly seldom in oxen. Reiterated experiments have been made at Berlin, in 1804, and have been attested by two other physicians there. The description of the proceedings is to be found in *Hufeland*'s Journal of practical physic, vol. xx. Every inoculated child has been re-inoculated with the natural small-pox, but they never took it.

Vaccination besides makes an astonishing progress in Germany, especially in the Prussian and Austrian countries, and has been successful every where.

Our Hamburgh Senate has published a warning against a kind of false Angustura bark which has been sold here, and operates as poison. It came from Spain as the true one; has some external resemblance of it; but as a decoction of it does not dye linen, becomes black by the solution of iron, &c. and the true bark dyeing linen yellow, is clear, and not altered by the solution of iron, both are easily distinguished.

Dr. *Grapengiesser*, at Berlin, and several others, as Dr. Ritter, &c. continue their experiments on Galvanism. They find it effectual in the case of deafness, even if connate. But it ought to be continued; and must never be applied with many plates. Then the cure will be permanent. Dr. G. has also cured thereby a local weakness of the muscles and nerves occasioned by mechanical extension.

Dr. *Joerderi*, at Berlin, has found assafœtida given in clysters, to be a sovereign remedy against the most obdurate obstructions. Even an old man, with an hernia inguinalis incarcerated, that began to degenerate into a sphacelus, although he had been without stools during eighteen days, was cured by this remedy.

The king of Prussia has forbidden the making Galvanic

experiments on beheaded bodies, as was done in Silesia, in order to prove that the head of such beheaded persons retained sense and consciousness. The reason alleged was, that it either increased the pain beyond the prescription of the law, or lessened the impression which such punishment was intended to make on the spectators.

The Russian Archiater, *Von Beck*, has published a remedy against the tænia lata. After a light dinner the patient takes, at four in the afternoon, a powder with water.

℞. Mercur. dulc. scrup. 1. corn. cervi. usti. cinnabar. antimonii ana gr. x. m. f. p. At supper the patient takes some *bouillon*, with a piece of bread and butter, and two ounces of *fresh* ol. amyg. Two hours after the tænia comes away. In case this should not operate, in the following morning is to be given, with a spoonful of syrup, and tea, to be taken *à jeun*,

℞. Rad. Fil. maris drachm 1.
——— jalap.
Gummi guttæ.
H. B. Cardui benedicti.
C. C. usti (or *Ebur* usti) ana 3 ss. m. f. pulv. subtiliss. in part. æquales 3 dividend.

When vomiting ensues, some weak tea or bouillon is to be drunk. If the whole tænia should not be driven out, the second powder, after two hours, is to be given, &c. The rest of the cure as usual, stomachic.

The New General Journal of Chemistry (*Neues allgemeines Journal der Chemie*), which is written by *Hermbstaedt*, *Klaproth*, *J. B. Richter*, *A. N. Scherer*, *J. B. Tromsdorff*, and published by A. F. Gehlen, began in 1803 at Berlin, and has been regularly continued. Three volumes are completed. The same plan as was adopted by Mr. Sherer in his Journal, is pursued in this continuation; only pharmacy is excluded, as Tromsdorff published a journal of pharmacy. A *critical* review of chemical books is reserved to *Tromsdorff* and *Wolff*'s particular works. The first volume contains, amongst many other treatises, Klaproth's analysis of meteorical stones and masses of metal; Chenevix on the pretended new metal Palladium, with remarks of the Editor, and Mr. Rose thereon. Vol. second contains Hermbstaedt's Inquiry into the origin of colours and new theory of their phenomena (a new theory of light consequently). He makes light to be a product of the mixture of a *protogenium* (productive matter or *productiven Stoff* of light) and caloric. The existence

Bischoff, at Berlin, and inserted in Hufeland's Journal, vol. xviii. p. 2.

Hermbstaedt, the celebrated chemist at Berlin, has proved that the jelly extracted from fresh bones of oxen and calves can be made into excellent portable soup, or dried cakes. One pound of bones gives 4 to 4¼ ounces of nourishing jelly, 1½ to 2 ounces fat, (and even when boiled with the meat only one-fourth less). The saving in money is very great, as also the use for the poor in hospitals, for soldiers in campaigns, on their marches and in sieges. The cakes ought to receive some addition of onions, turnips, some spice, and also salt.

The Danish government has ordered that use is to be made of this invention for their shipping and marine. One pound of meal of bones cooked twice, gives as much good soup (though tasteless without additions) as eleven pounds of meat; and by the help of 70 dollars, you may do the same as with bouillon-paste for 4000 dollars.

The invention of this jelly of bones, and meal of bones, which Mr. Cadet de Vaux had made public as his own, has been reclaimed, in a particular pamphlet, by Doctor and Professor *Ploucquet*, at Tubingen, who, in 1771, wrote a pamphlet thereon, and showed that only in the Wirtemberg country, with the rejected bones, 50,700 men could be fed for ninety days, and 37,000 bushels (scheffel) corn thereby saved. But he was disregarded.

Report of a Committee of the National Institute of France, on the Question, "Whether those manufactories from which a disagreeable smell arises may prove injurious to health?"

The solution of this problem is, doubtless, of very considerable consequence, as, from the great confidence reposed in the decisions of the National Institute, it will, probably, form the basis of laws upon which the regulations of the police depend; and since in Paris, the fate of the most useful establishments, and the existence of many arts has hitherto depended on the award of individuals, and that some driven to a distance from materials, from workmen, or consumers, by prejudice, ignorance, or jealousy, continue to maintain a disadvantageous struggle against innumerable obstacles, by which their growth is opposed.

To arrive at the true solution of the problem, the report takes a view of the several arts against which a clamour has been raised, and it divides them into two classes. The first

comprises all those, the processes of which allow aëriform emanations to escape from them into the surrounding atmosphere, either in consequence of putrefaction or fermentation. The second class includes those, in which the artist, operating by the aid of fire, developes and evolves in air or vapour, various principles, which are more or less disagreeable to respire, and reputed more or less injurious to health.

After having examined the nature of the principal manufactories against which considerable prejudice has been excited at different times, and in different places, the Reporters infer, that there are but few, the vicinity of which is dangerous to health. " Hence," say they, " we cannot too strongly exhort those magistrates who have the health and safety of the public committed to their charge, to disregard unfounded complaints, which are too frequently brought against different establishments, daily threaten the prosperity of the honest manufacturer, check the progress of industry, and endanger the fate of the art itself.

" The magistrate ought to be on his guard against the proceedings of a restless and jealous neighbour; he should carefully distinguish what is only disagreeable or inconvenient, from what is dangerous or injurious to health; in short, he should be fully aware of this truth, that by listening to complaints of this nature, not only would the establishment of several useful arts in France be prevented, but we should insensibly drive out of our cities, the farriers, carpenters, joiners, brasiers, coopers, founders, weavers, and all those occupations which are more or less disagreeable to their neighbours. The right of toleration has been established by time and necessity; let us not doubt, therefore, but our manufactures, when grown older, and better known, will peaceably enjoy the same advantage in society; in the mean time we are of opinion, that the class ought to avail itself of this circumstance, to put them in a particular manner under the protection of government, and declare publicly that the manufacture of acids, sal-ammoniac, Prussian blue, sugar of lead, white lead, starch, beer, and leather, as well as slaughter-houses, are not injurious to the health of the vicinity, when they are properly conducted.

" We cannot say as much for the steeping of hemp, making catgut, laystalls, and, in general, establishments where a large quantity of animal and vegetable matter is subject to humid putrefaction: in all these cases, besides the disagree-

able smell which they exhale, miasmata, more or less deleterious, are evolved.

We must add, that though the manufactories of which we have already spoken, and which we have considered as not injurious to the health of the neighbourhood, ought not to be removed, yet administration should be requested to watch over them strictly, and consult with well informed persons for prescribing to the conductors the most proper measures for preventing their smoke and smell from being diffused in the vicinity. This end may be attained by improving the processes of the manufactures, raising the outer walls, so that the vapours may not be diffused among the neighbours; improving the management of the fires, which may be done to such a point, that all the smoke shall be burnt in the fire-place, or deposited in the tunnels of long chimnies; and maintaining the utmost cleanliness in the manufactories, so that nothing shall be left to putrify in them, and all the refuse capable of fermentation be lost in deep wells, and prevented from any way incommoding the neighbours.

"We shall observe too, that when new manufactories of Prussian blue, sal-ammoniac, leather, starch, or any other article by which vapours, very inconvenient to the neighbours, or danger of fire or explosions, are to be established, it would be wise, just, and prudent, to lay it down as a principle, that they are not to be admitted into cities, or near dwellings, without special authority; and that if persons neglect to comply with this indispensable condition, their manufactories may be ordered to be removed without any indemnification.

"It follows from our report; 1st. That catgut manufactories, laystalls, steeping of hemp, and every establishment in which animal or vegetable matters are heaped together to putrify in large quantities, are injurious to health, and ought to be remote from towns and every dwelling-house. 2dly. That manufactories, where disagreeable smells are occasioned through the action of fire, as in the making of acids, Prussian blue, and sal-ammoniac, are dangerous to the neighbours only from want of due precautions, and that the care of government should extend only to an active and enlightened superintendance, having for its objects the improvement of their processes, and of the management of the fire, and the maintenance of cleanliness. 3dly. That it would be worthy a good and wise government, to make regulations

prohibiting the future establishment of any manufacture, the vicinity of which is attended with any essential inconvenience or danger, in towns and near dwelling-houses, without special authority previously obtained. In this class may be comprized the manufactories of *poudrette* (dry night soil), leather, and starch; founderies, melting-houses for tallow, slaughter-houses, rag-warehouses, manufactories of Prussian blue, varnish, glue and sal-ammoniac, potteries," &c.

These conclusions were adopted by the Institute, and addressed to government, with an invitation to make them the basis of its decisions.

Method of preserving Vegetables.

It is not generally known that green succulent plants are much better preserved after a momentary immersion in boiling water, than otherwise. The treatment is adapted for the economical preservation of cabbage and other plants which are dried for keeping, as it destroys the vegetable life at once, and seems to prevent an after process of decay or mortification, by which the plant would have been more considerably changed, if it had not been so suddenly killed.

Spontaneous Combustion of the Human Body.

Dr. Kopp has made interesting inquiries on the spontaneous combustion of the human body. It was formerly an almost general opinion that the combustion only took place in drunkards, and it was believed that their whole frame was impregnated with the spirituous liquor. But on comparing the different cases which Dr. Kopp has had an opportunity to collect, it appears that the combustion chiefly takes place in elderly people, and mostly in women. In general in all these instances the victims were very fat or very lean, which proves a weak state of the constitution, and they were accustomed to drink spirituous liquors. The combustion penetrated rapidly the whole body, but the trunk was the most injured. Almost in all cases a fire was at hand. In several instances the patients complained that they perceived something like an electrical stroke in some part of the body. The accident mostly happened when the atmosphere was dry and clear, and an empyreumatic smell surrounded the persons. It is therefore probable that an asthenic state of the lymphatic system may be considered as a predisposing cause, in consequence of which inflammable air might be collected in the cellular membrane and other cavities of the body; and

in the same manner as a watery fluid is collected in the cellular system in the dropsy, it may contain, when such an accident takes place, a collection of inflammable gas. It is very probable that electricity has some influence, as in several instances the combustion began with an electrical phenomenon. The flame is like the inflammable gas, and spreads in general so rapidly, that it has been impossible to give assistance to the victims of this horrible disease.

Method of removing Spots of Oil and Grease.

M. Lenormand gives the following as a new and easy method of instantly removing spots of oil, grease, and tallow, from any kind of stuff, without changing its colour. "Take five or six pieces of lighted charcoal, about the size of a walnut; wrap them in a piece of linen which has been previously dipped in water, and squeezed in the hand to press out the superabundant moisture; extend the stuff that is spotted on a table on which a clean napkin has been spread, then take the cloth containing the charcoal by the four corners and lay it on the spot; lift it up and put it down on the spot ten or twelve times successively, pressing lightly upon it, and the spot will disappear."

Remedy for Tinea Capitis.

Mr. Barlow, of Blackburn, Lancashire, has communicated to the public, a specific remedy for *Tinea Capitis*, which, in a great variety of cases, during the last ten years, he has never known to fail of making a perfect cure.

℞ Kali Sulph. (recent. præparat.) ʒ iij.
Sap. Alb. Hispan. ʒ iss.
Aq. Calcis. ℥ viiss.
Sp. Vin. Rectif. ʒ ij. m. ft. lotio.

The head must be bathed with this lotion night and morning, suffering the parts to dry without interruption.

London Monthly Mag. for Dec. 1805, p. 453.

Experiments to prove that mere Oxyds of Iron are not magnetic.

Mr. Timothy Lane, in a paper laid before the Royal Society, has attempted to prove that mere oxyds of iron are not magnetic; that any inflammable substances mixed with them do not render them magnetic, until they are by heat chemically combined with the oxyds, and that when the combustible substance is again separated by heat, the oxyds return

to their unmagnetic state. By repeated experiments Mr. Lane found that heat alone produced no magnetic effect on the oxyd, and that inflammable matter with heat always rendered some of the particles magnetic.

Exp. 1. He mixed some oxyds of iron with coal, in a glass mortar, and continued rubbing them together for some time without any magnetic effect. The mixture was then put into a tobacco-pipe, and placed in the clear red-heat of a common fire. As soon as the pipe had acquired a red-heat it was taken out. The mixture was put on a glazed tile to cool, and proved highly magnetic.

Exp. 2. He rubbed some oxyds of iron in a glass mortar, with sulphur, charcoal, camphor, ether, alkohol, &c. but no magnetism was produced without a heat equal to about that of boiling lead.

Small quantities of any inflammatory matter in a red heat have an evident effect on the oxyd. Hydrogen, aided by a read heat, renders the oxyd magnetic. Alkohol, if pure, has the same effect.

The portion of inflammable matter requisite to render a considerable quantity of oxyd magnetic is very small, since a single grain of camphor, dissolved in an adequate portion of alkohol, and mixed with 100 grains of the oxyd in a glass mortar, will, by a red heat, render the whole magnetic.

As oxyds of iron are rendered magnetic by heat when mixed with inflammable matter, it may be understood why Prussian blue, sulphurets, and ores of iron containing inflammable matter, become magnetic by the agency of fire; while these same ones revert to their unmagnetic state, when the heat has been continued long enough to drive off the whole of the inflammable matter. Thus calcined sulphurets of iron, distinguishable by their red colour, are found among the cinders of a common fire, unmagnetic, when all the sulphur is sublimed.

Artificial Tanning.

Mr. Hatchett has given two papers "On an Artificial Substance which possesses the principal characteristic Properties of Tanning." He defines tanning to be a peculiar substance or principle, which is naturally formed, and exists in a great number of vegetable bodies, such as oak-bark, galls, sumach, catechu, &c. commonly accompanied by extract, gallic-acid, and mucilage. Recent experiments have

convinced Mr. H. that a substance possessing the chief characteristic properties of tanning may be formed by very simple means, not only from vegetable, but even from mineral and animal substances. It may be formed by exposing carbon to the action of nitric acid, and this is best effected when the carbon is uncombined with any other substance excepting oxygen.

A portion of Bovey coal was exposed to a red heat in a close vessel, and was then reduced to powder and digested with nitric acid. Nearly the whole was converted into the tanning substance. A coal from Sussex, and a piece of the Surturbrand from Iceland, yielded similar results.—Deal saw-dust also, converted first into charcoal, and then treated in the manner already described, yielded a liquid which copiously precipitated gelatine.

These are but a part of Mr. Hatchett's experiments. They are, however, sufficient to exhibit the principle, and to justify the conclusion, "That a substance very analogous to tanning, which has hitherto been considered as one of the proximate principles of vegetables, may be produced by exposing carbonaceous substances, whether vegetable, animal, or mineral, to the action of nitric acid."

The efficacy of this new substance has been proved by actual practice, and Mr. H. has converted skin into leather by means of materials, which, to professional men, must, as he conceives, appear extraordinary, such as deal saw-dust, asphaltum, turpentine, pit-coal, wax-candle, and even a piece of the same sort of skin. Hence it is hoped that an economical process may be discovered, so that every tanner may be enabled to prepare his leather even from the refuse of his present materials.

Mr. Hatchett's second paper contains additional experiments and remarks on the same substance, from which it appears, that three varieties of the artificial tanning substance may be formed; viz.

1. That which is produced by the action of nitric acid upon any carbonaceous substance, whether vegetable, animal, or mineral.

2. That which is formed by distilling nitric acid from common resin, indigo, dragon's blood, and various other substances.

3. That which is yielded to alkohol by common resin, elemi, assafœtida, camphor, &c. after these bodies have been some time previously digested with sulphuric acid.

The first variety is most easily formed; and in some cases 100 grains of dry vegetable charcoal afforded 120 of the tanning substance.

The second variety is obtained from a great variety of vegetable bodies, by digesting and distilling them with nitric acid; but it is not so readily prepared as the first, nor in so large proportional quantities.

The third variety appears to be uniformly produced during a certain period of the process, but by long continuance of the digestion it is destroyed.

Substances, such as gums, which afford much oxalic acid by treatment with other acids, do not yield any of this tanning substance. The energy of its action on gelatine and skin is inferior to that of the first variety, into which, however, it may be easily converted by nitric acid.

A cheap method of obtaining the Sugar of the Beet-root.

Mr. Hermbstadt, of Berlin, gives the following as a cheap method of obtaining the sugar of the beet-root:—Let the beet-roots be pounded in a mortar, and then subjected to the press; the juice is next to be clarified with lime, like that of the sugar-cane, and then by evaporation bring it to the consistence of syrup. From 100 lbs. of raw sugar thus obtained, 80 lbs. may be had by the first refining, of well-crystalized sugar, inferior neither in quality nor whiteness to that of the West-Indies. Two days are sufficient to complete the operation.

Effect of Oil and Warmth on cutting Instruments.

Dr. Faust, in conjunction with Dr. Hunold, of Cassel, will speedily publish a work, in which they will demonstrate that, excepting the lancet employed in vaccination, all the instruments of surgery ought to be dipped into oil at the moment when they are going to be used; by which method the pain of the subject operated upon will always be diminished. In the same work it is recommended to make all instruments of a blood-heat a little before the operation. These two precautions have already been practised in certain cases, and with certain instruments.

Powers of different Antiseptics.

Dr. Valli having left a pound of soup, in which were 12 or 15 grains of red precipitate, exposed to the open air for four months, found it exhibited no sign of putrefaction. He

repeated the experiment for a month in the height of summer, with the same effect.

M. Van Mons has found broth keep for many years by means of a few grains of mercury in the state of oxyd and citrate. Nitrate of silver has long been considered as the most powerful of antiseptics, and those of gold and mercury are equally so. Oxygenated muriate of pot-ash retarded the putrefaction of strong soup several days, and ultimately put a stop to it at a certain point. Very dilute nitric acid, and oxygenated muriatic acid preserved soup for several months.

Case of Scald successfully treated by Spirit of Turpentine.

A very striking case is recorded of a cure of a child, seven months old, scalded by having a kettleful of boiling water overturned, by the application of the *Spt. Terebinth* externally, and of opium internally. The pain ceased in half an hour, and in three weeks a perfect cure was effected. To prove the good effect of the stimulant plan, this child took in four days sixty drops of tinct. opii, the same quantity of liquor volat. corn, cervi, and almost a bottle of sherry in whey. The case is communicated by Dr. Kentish, from Dr. Felix, surgeon of his Mejesty's ship San Josef.

Fothergillian Prize Medal.

The London Medical Society propose to confer the *Fothergillian Gold Medal* upon the authors of the best essays on the following subjects.

Question for the year 1806.—What are the disorders that have been mistaken for syphilis, and how are they to be distinguished from it?

For the year 1807.—The best account of the epidemic fevers which have prevailed at several times in North-America, Spain, and Gibraltar, since the year 1793, and whether they are the same or different diseases?

For the year 1808.—What are the best methods of preventing and of curing epidemic dysentery?

For the year 1809.—What are the criteria by which epidemic disorders that are not infectious may be distinguished from those that are?

For the year 1810.—What are the qualities in the atmosphere most to be desired under the various circumstances of pulmonary consumption?